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PUBLICATIONS OF THE

BRITISH FIRE PREVENTION COMMITTEE.—No. 50.

Edited by Edwin O. Sachs.

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FIRE TESTS WITH DOORS.

(Da) A 2⅛-in. DOOR OF ARCHANGEL DEAL, CONSTRUCTED IN THREE THICKNESSES.

(Ea) A 1⅞-in. DOOR OF TEAK, FLUSH PANELLED ON EACH SIDE, THE PANELS BEING IN TWO THICKNESSES.

Particulars
of
EXPERIMENTAL FIRE TESTS.

LONDON, 1900.

Published at the Offices of
THE BRITISH FIRE PREVENTION COMMITTEE
[illegible]
1, Waterloo Place, Pall Mall.

TEAK DEAL

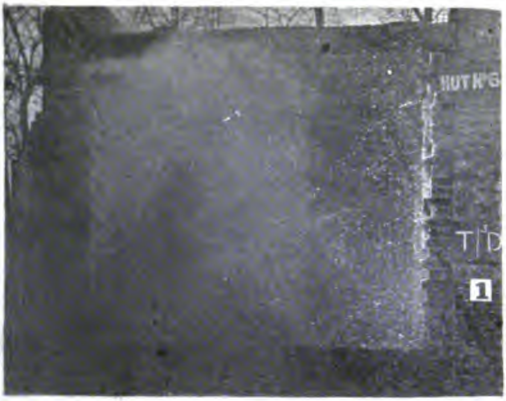

FIG 1 TEMP 125° TIME 2.42pm

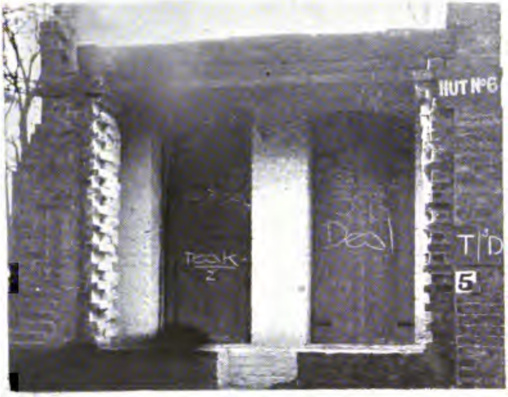

FIG 5 TEMP 1290° TIME 3.2pm

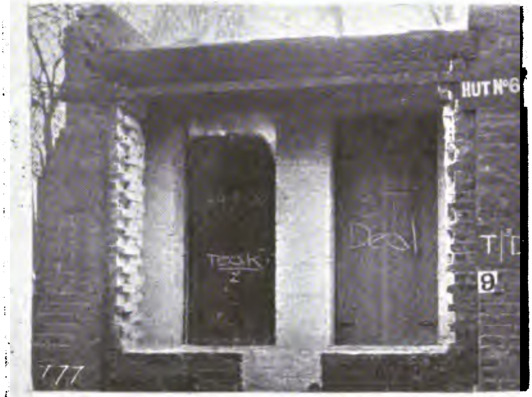

FIG 9. TEMP 1700° TIME 3.22pm

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London, 1900.

Published at the Offices of
THE BRITISH FIRE PREVENTION COMMITTEE
(Founded, 1897—Incorporated, 1899),
1, Waterloo Place, Pall Mall.

Two Shillings and Sixpence.

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No. 24.—EXPERIMENTAL FIRE TESTS WITH DOORS (G, H AND I).
No. 25.—EXPERIMENTAL FIRE TESTS WITH DOORS (K AND L).
No. 26.—EXPERIMENTAL FIRE TESTS WITH DOORS (M AND N).
No. 27.—OFFICIAL FIRE TEST WITH PARTITIONS (No. 7).
No. 28.—OFFICIAL FIRE TESTS WITH CEILINGS (No. 8).
No. 29.—OFFICIAL FIRE TESTS WITH GLASS (No. 5).
No. 30.—OFFICIAL FIRE TESTS WITH GLASS (No. 6).
No. 31—OFFICIAL FIRE TESTS WITH GLASS (No. 11).
No. 32.—OFFICIAL FIRE TESTS WITH GLASS (No. 12).
No. 33.—EXPERIMENTAL PLAIN GLASS TESTS (O, P AND Q).
No. 34.—EXPERIMENTAL FIRE TESTS WITH FLOORS (R).
No. 35.—EXPERIMENTAL FIRE TESTS WITH DOORS (S AND T).
No. 36.—OFFICIAL FIRE TESTS WITH TREATED WOOD (No. 9).

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OBJECTS OF THE COMMITTEE.

The main objects of the Committee are :—

To direct attention to the urgent need for increased protection of life and property from fire by the adoption of preventive measures.

To use its influence in every direction towards minimising the possibilities and dangers of fire.

To bring together those scientifically interested in the subject of Fire Prevention.

To arrange periodical meetings for the discussion of practical questions bearing on the same.

To establish a reading-room, library and collections for purposes of research, and for supplying recent and authentic information on the subject of Fire Prevention.

To publish from time to time papers specially prepared for the Committee, together with records, extracts, and translations.

To undertake such independent investigations and tests of materials, methods and appliances as may be considered advisable.

The Committee's Reports on Tests with Materials, Methods of Construction, or Appliances are intended solely to state bare facts and occurrences, with tables, diagrams, or illustrations, and they are on no account intended to read as expressions of opinion, criticisms, or comparisons.

NOTE.

The report presented in this publication again shows the results obtained in two door tests. The teak door used in this case had been condemned by a district surveyor as not complying with our Building Act, the panels being constructed in two thicknesses, whilst, of course, our Regulations read that teak, when used for doors, should be solid.

The deal door was one that was specially constructed for the purposes of this test and in which clinched nails were used, whilst in previous door tests undertaken under the auspices of this Committee three thicknesses of wood were used, these thicknesses being held together by wood brads, and not by nails.

Of course this publication should be read together with the reports on other door tests, particularly in this case with the door tests where solid teak panels were used, and the other tests with three thickness doors, constructed in a different manner.

EDWIN O. SACHS.

October 1st, 1900.

THE GENERAL ARRANGEMENTS FOR TESTS.

(*MEMORANDUM.*)

The purpose of the tests undertaken by the British Fire Prevention Committee is to obtain reliable data as to the exact fire-resistance of the various materials, systems of construction, or appliances used in building practice.

The tests are of an entirely independent character, arranged on scientific lines, but with full consideration for the practical purpose in view. Absolute reliability is assured, records being mostly taken automatically or by photography, and the temperatures being easily regulated by the application of gas.

All reports on tests solely state the bare facts and occurrences, with tables, diagrams and illustrations, and on no account are reports to include expressions of opinion, nor should any expression be read as a comparison or criticism.

The general arrangement and direction of the tests are in the hands of the Executive, who act in accordance with certain principles laid down after careful study and experiment. The official tests are attended by the members of the Council and the members of the Committee in rotation.

As to the Testing Station, it comprises two houses standing in their own grounds near Regent's Park, and backing on to the Regent's Canal. The principal building is used for Committee Rooms and laboratory purposes, whilst the gardens are utilised for so-called "full-size" tests.

As to the financial aspect of the station, the establishment expenses are being met by a special subscription. As far as the funds of the Committee permit, investigations and experimental tests with ordinary (*i.e.*, not patented) forms of construction are undertaken from time to time and duly reported on. Official tests with patented materials, makers' systems, etc., etc., are subject to a scale of charges. The Testing Station is also open to members for such private research work or tests they may desire to undertake.

The services of the members participating in the management of the station, conducting or attending tests, are given entirely gratuitously.

For the Executive,

EDWIN O. SACHS, *Chairman.*

EXPERIMENTAL FIRE TESTS

CONDUCTED BY THE EXECUTIVE

OF THE

British Fire Prevention Committee.

[FOUNDED 1897.—INCORPORATED 1899.]

FIRE TEST Da, Ea.—MARCH 28TH, 1900.

(Da) A $2\frac{3}{8}$-in. Door of Archangel Deal, constructed in three thicknesses.

(Ea) A $1\frac{5}{8}$-in. Door of Teak, flush panelled on each side, the panels being in two thicknesses.

OBJECT OF TEST.

To record the effect of a fierce fire ot one hour, gradually increasing to a temperature of 2,000° Fahr.

Note.—The fire was to be applied from one side, and the doors were to open inwards on to the fire side.

Note.—The door-openings were to be approximately 3 ft. by 7 ft.

SUMMARY OF EFFECT.

DEAL DOOR.

In 53 minutes flame appeared on the outside through the vertical joint between boards in centre of door just above the sill.

In 66 minutes a hole about 6 inches square was burnt through door in centre just above sill, and also a small hole level with top bolt in second joint from east side, there was no other sign of damage on the outside.

At the conclusion of the test the door remained in position.

After conclusion of the test it was seen that the two inner thicknesses were practically gone.

TEAK DOOR.

In 16 minutes flame appeared over the top of door.

In 53 minutes the whole of the top rail of door was burning, and flame also appeared between joints of lower panels and muntin.

In 58 minutes the west portion of top rail fell.

In 65 minutes the greater part of the door fell, leaving the east style, a portion of the west style and the bottom rail in position, but much burnt.

Note.—The duration of the test was 71 minutes, or 11 minutes beyond the hour defined in the "Object of Test."

DESCRIPTION OF THE TESTING PLANT.

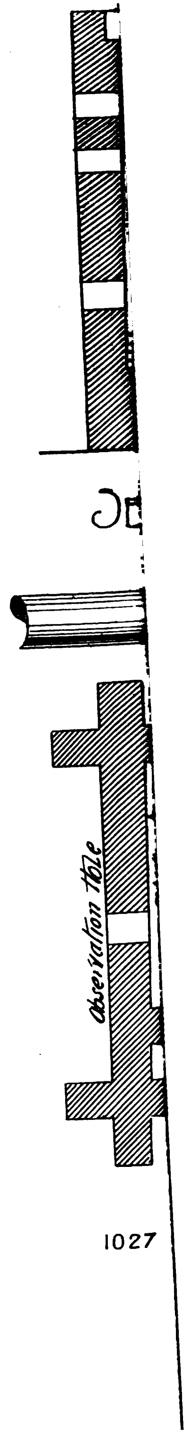
(*See Figs.* A, B, C *and* D.)

The Testing Chamber used was located at the Committee's Testing Station, and was known as No. 6 Hut.

The hut was constructed, as shown, of stock bricks with lime mortar, and measured 10 ft. by 10 ft. internally.

The ceiling of the hut was 9 ft. 6 in. above the pavement of the chamber, and was formed of solid wood beams grouted with fire-clay. The chamber in which the fire was measured 10 ft. by 7 ft. 10 in.

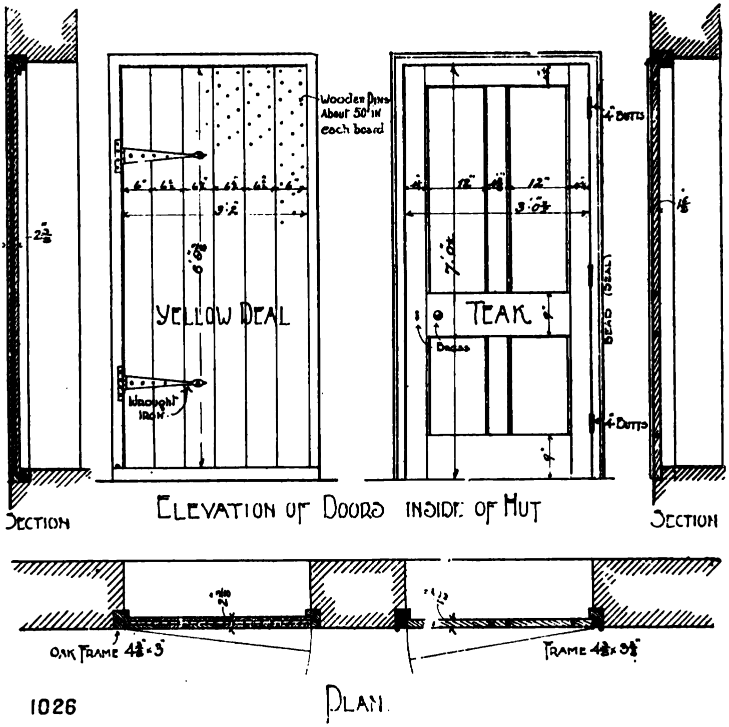
The fuel used was gas produced at the station, and the supply was regulated by valves and dampers.



1027

The gas was admitted through two mixing chambers of fire-brick, as shown.

Two Roberts-Austen pyrometers were used for recording temperatures, to take four observation records from points Nos. 1, 2, 3 and 4, points Nos. 2 and 3 being outside the doors, and the others on the fire side of the doors. A continuous record was also taken from point No. 5.



Details of Doors. *Figs.* E *and* F.

There were observation holes in the east and west walls, closed by moveable iron shutters.

The draught holes were in the east and west walls.

The photographs were taken partly by daylight and partly by flashlight.

A brick wall, 14 in. thick, with two openings 3 ft. 3 in. wide, 7 ft. high, was built across the hut, running from east to west. It was built 13 in. back from the main wall, the wall was carried up to the ceiling, the height between the floor and the ceiling being 9 ft. 6 in. The two openings were arched over with brick arches in two half-brick rings. The wall was built with gauged stuff.

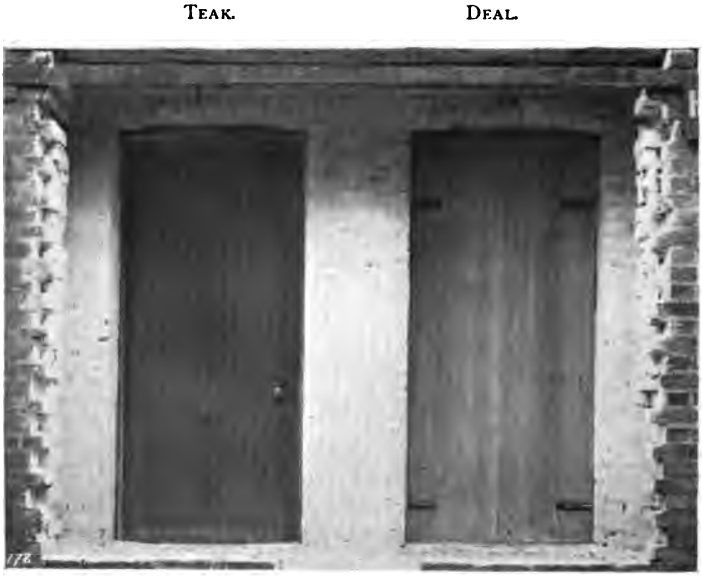


Fig. G. VIEW OF DOORS BEFORE TEST (FROM OUTSIDE).

CONSTRUCTION OF THE DOORS.

On March 26th the doors were put into position. The door on the east side was of teak, and that on the west side of clean yellow deal from Archangel.

DEAL DOOR.

The deal door was 3 ft. 2 in. wide by 6 ft. $9\frac{3}{8}$ in high, $2\frac{3}{8}$ in. thick, constructed of three thicknesses of boards, the middle thickness being horizontal, and the outer ones vertical. The boards were butt jointed; they were secured together with ⅜ in. deal double wedge-shaped pins, driven in from both sides, about fifty to each board. The top and sides of door were splayed to fit the splayed rebate on frame.

The door was hung on two wrot iron cross garnet hinges, the door was fastened with four 6-in. iron neck barrel bolts to a frame of oak, 4⅜ in. by 3 in., with a splayed rebate, the screws to secure the bolts being 1¼ in. long and only driven into the outer thickness. The frame was secured to the brickwork by spikes driven into deal plugs inserted in the joints of the brickwork.

TEAK DOOR.

The teak door was 3 ft. 0⅞ in. wide by 7 ft. 0½ in. high, 1⅝ in. thick, four panel, bead butt both sides, the panels being flush each side, the panels being in two thicknesses.

The styles and top rail were 4¼ in. wide; the centre and bottom rails were 9 in. wide. The panels were tongued into the styles and rails. The door was hung with three 4-in. wrot iron butt hinges and secured with a 5-in. mortice lock and brass furniture, to a teak frame 4⅜ in. by 3⅜ in., with a ½ in. rebate. The frame was secured to the brickwork by spikes driven into deal plugs inserted in the joints of the brickwork.

The frames were pointed all round with mortar.

THE TEST.

(See Figs. 1 *to* 12, E *to* L*).*

On March 28th, 1900, the test was undertaken.

The following is a log of the test:—

At 3 p.m. the meteorological observations taken at the Botanic Gardens, Regent's Park, read as follows:—State of weather, overcast; Rain, none; Wind, N.N.E.; Barometer, 29·54 in.; Attached Thermometer, 43° Fahr.; Dry Bulb, 39·2° Fahr.; Wet Bulb, 36·8° Fahr.; Remarks, dull afternoon, cold, hazy.

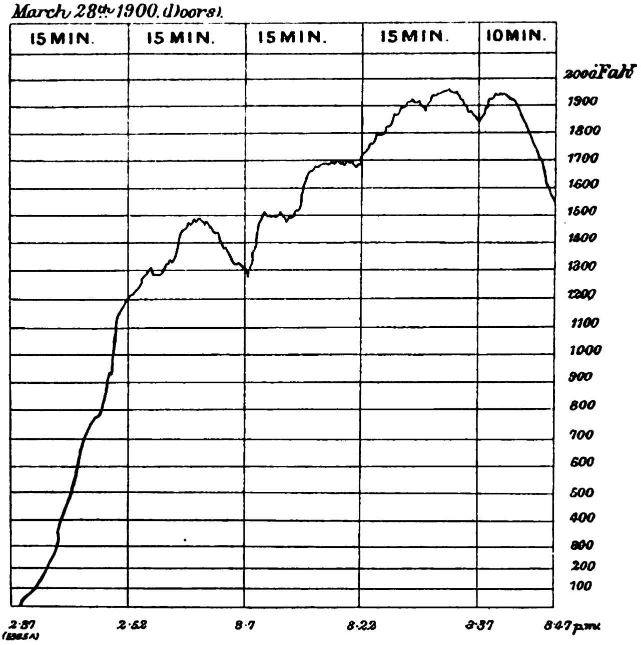
The following temperature observations were taken during the test from points Nos. 1, 2, 3 and 4, and the diagram on next page shows the continuous record from point No. 5.

OBSERVATIONS TAKEN AT POINTS NOS. 1, 2, 3 & 4.

From 2.39 *p.m. to* 3.48 *p.m.*

	INSIDE.		OUTSIDE.	
TIME.	No. 1. Fahr.	No. 4. Fahr.	No. 2. Fahr.	No. 3. Fahr.
2.39 p.m.	300°	110°	—	—
2.42 „	100°	150°	—	—
2.45 „	500°	875°	—	—
2.48 „	1,100°	1,200°	—	—
2.51 „	1,200°	1,300°	—	—
2.54 „	1,200°	1,300°	—	—
2.57 „	1,350°	1,410°	—	—
3.0 „	1,350°	1,440°	103°	—
3.3 „	1,240°	1,340°	105°	—
3.6 „	1,302°	1,460°	103°	—
3.9 „	1,390°	1,490°	150°	—
3.12 „	1,460°	1,610°	200°	—
3.15 „	1,580°	1,675°	275°	—
3.18 „	1,550°	1,630°	345°	—
3.21 „	1,625°	1,740°	380°	—
3.24 „	1,700°	1,820°	550°	—
3.27 „	1,780°	1,860°	730°	—
3.30 „	1,850°	1,900°	890°	—
3.33 „	1,800°	1,850°	1,080°	—
3.36 „	1,750°	1,800°	1,060°	—
3.39 „	1,800°	1,860°	1,410°	—
3.42 „	1,700°	1,750°	1,300°	—
3.45 „	1,490°	1,550°	1,160°	105°
3.48 „	1,400°	1,450°	1,050°	100°

AUTOMATIC RECORD AT POINT NO. 5.



DEAL DOOR.

Observations on the Outside.

At 2.37 p.m. the gas was lighted. (See Fig. G.)

TEAK DOOR.

Observations on the Outside.

At 2.37 p.m. the gas was lighted. (See Fig. G.)

At 2.39 p.m. smoke came through the joint between top of door and frame.

DEAL DOOR—*continued.*

At 2.44 p.m. smoke came through the joint between top of door and frame at west corner and for about 12 inches down west side.

TEAK DOOR—*continued.*

At 2.53 p.m. flame appeared intermittingly over top of door at west corner.

At 2.55 p.m. flame appeared all along the top of door.

At 3.0 p.m. the top of door was twisted inwards $\frac{3}{4}$ in. at west side and $\frac{1}{4}$ in. at east side.

At 3.0 p.m. flame appeared about 15 in. down west side of door from top.

At 3.24 p.m. flame appeared through keyhole, and through the wood around lock, the flame over door increasing, top rail being much burnt.

At 3.26 p.m. door bulging outwards in centre, about middle of upper panels.

Deal Door—*continued.*	Teak Door—*continued.*
At 3.30 p.m. first appearance of flame through the joint between boards in centre of door above sill, about 2 in. long.	At 3.30 p.m. the whole of the top rail of door was burning and flame beginning to extend down style and panel on the west side. Flame also appeared between east lower panel and muntin at bottom.
At 3.35 p.m. flame appeared through centre board at bottom where one of the pins had been burnt through. (See Fig. I.)	At 3.35 p.m. flame appeared between joints on both sides of west lower panel and on west side of east lower panel; whole height of panel, west portion of top rail fallen in. (See Fig. I.)
At 3.42 p.m. a hole about 6 in. square was burnt through the door in centre above sill, and also a small hole level with top bolt in second joint from east side, but there was no other sign of damage on the outside. (See Fig. L.)	At 3.42 p.m. the greater part of the door fell, leaving the east style, a portion of the west style and the bottom rail in position, but much burnt. (See Fig. L.)
At 3.48 p.m. the gas was shut off.	At 3.48 p.m. the gas was shut off.
At 3.49 p.m. water was applied to the outer face of door for two minutes.	

DEAL DOOR—*continued.*

Observations on the Inside.

At 2.44 p.m. the face of the door commenced to blaze all over.

At 3.30 p.m. the whole of the inner thickness of the door had fallen except some small portions, and the lower hinge was quite clear of door.

TEAK DOOR—*continued.*

Observations on the Inside.

At 2.44 p.m. the face of door commenced to blaze all over.

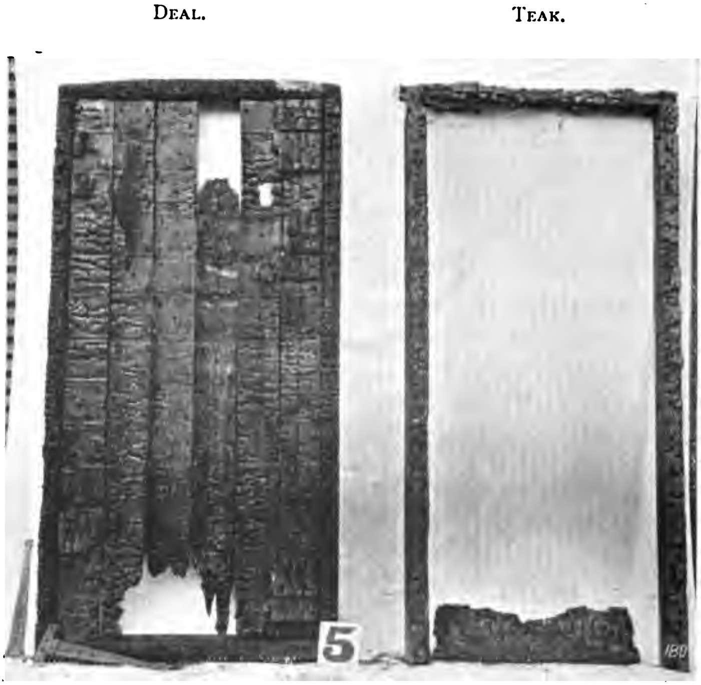


Fig. M VIEW OF DOORS SHOWING CONDITION OF INSIDE AFTER REMOVAL.

OBSERVATIONS AFTER TEST.

DEAL DOOR.

The whole of the inner thickness was gone, also almost all the middle thickness, except some fragments down each side. (See Figs. M and N.)

TEAK DOOR.

The styles which remained up when remainder of door fell were badly burnt and fell shortly after. The lower rail was also much burnt. (See Figs. M and N.)

On the 29th March the doors were removed and photographs shown in Figs. M and N were taken.

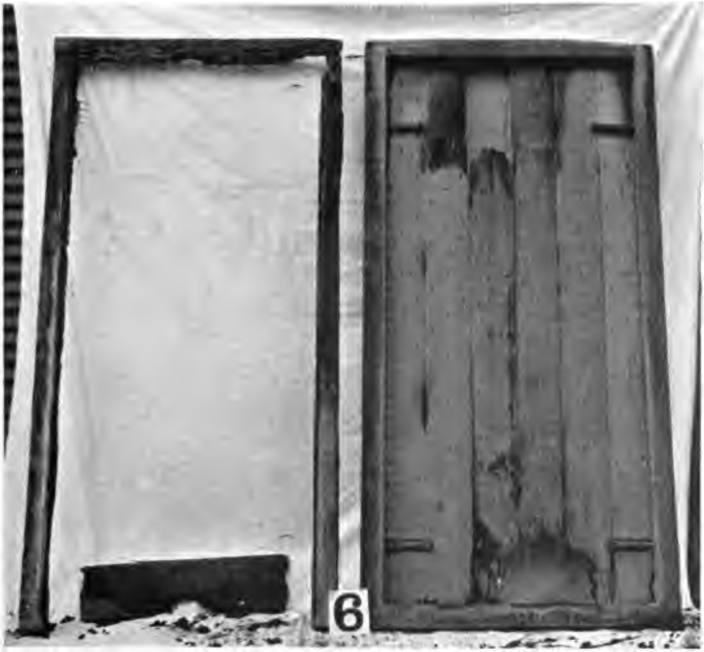


Fig. N. VIEW OF DOORS SHOWING CONDITION OF OUTSIDE AFTER REMOVAL.

GENERAL ARRANGEMENTS.

The test was carried out according to the procedure laid down by the Executive for investigations of this kind, and conducted by a Sub-Committee of the Executive, comprising :—

Mr. Max Clarke, A.R.I.B.A.
Mr. Ellis Marsland, District Surveyor, Camberwell.
Mr. Matt Garbutt, A.M.Inst.C.E.

Mr. Thomas Kissack (Resident Engineer at the Testing Station) assisted the Sub-Committee.

Mr. H. B. White, M.I.E.E., superintended the Instrument Room.

The Council was represented by :—
Sir John Taylor, K.C.B. (H.M. Office of Works).
Mr. Arthur Cates, F.R.I.B.A. (late Surveyor, Crown Estates).

The Executive was represented by :—
Mr. Edwin O. Sachs (Chairman).
Mr. Chas. E. Goad, M.Am.Soc.C.E.
Mr. F. Hammond, F.R.I.B.A., District Surveyor, East Hampstead.

The Members' Testing Sub-Committee was represented by :—
Mr. George E. Monckton, M.A.

The general body of members was represented by :—
Mr. F. Sizer Capon, Architect's Department, London County Council.
Mr. Arthur Crow, F.R.I.B.A., District Surveyor, Whitechapel.
Mr. Bernard Dicksee, A.R.I B.A., District Surveyor, E. Newington.
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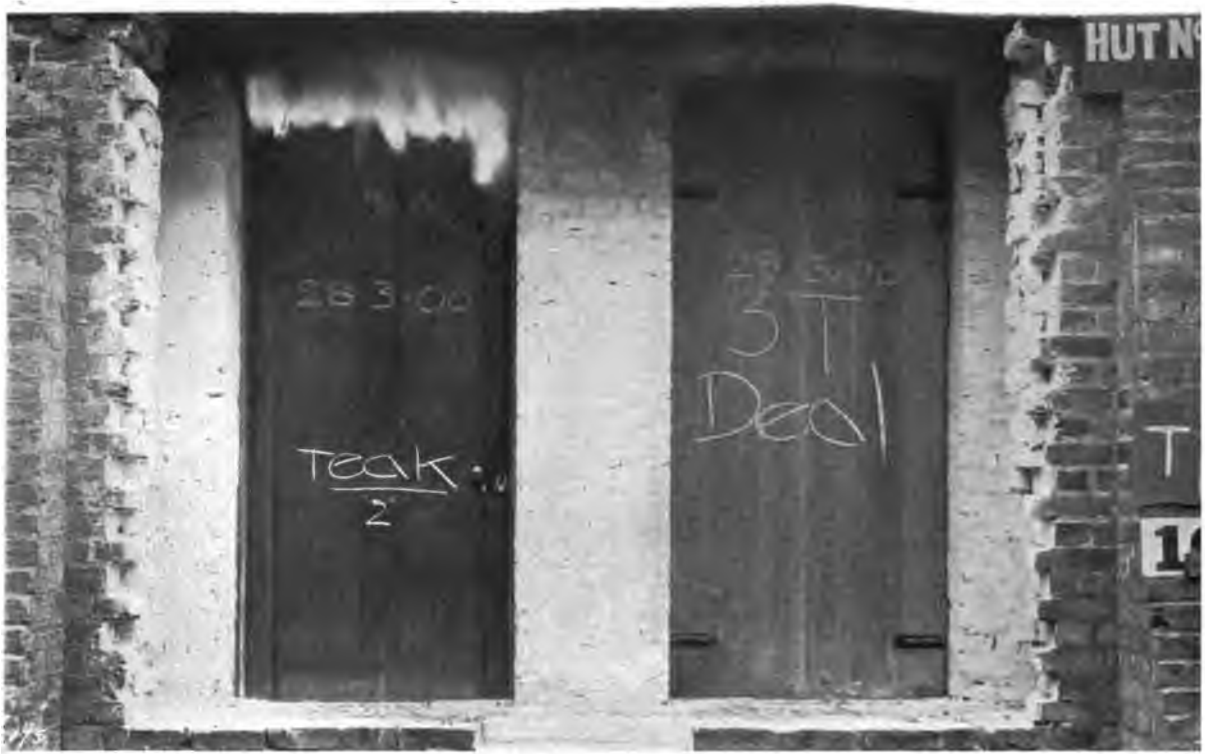

Fig. 11. VIEW OF DOORS SHOWING CONDITION AFTER 50 MINUTES.

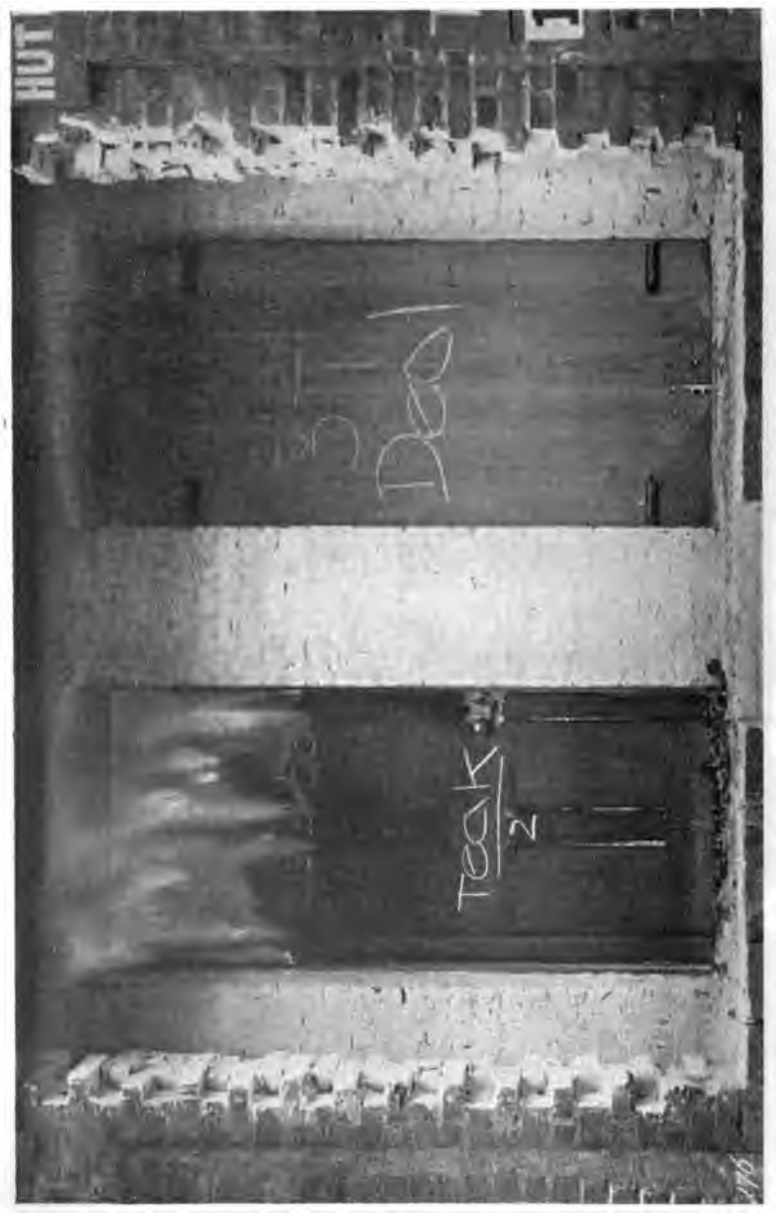

Fig. 1. View of Doors showing Condition after 60 Minutes.

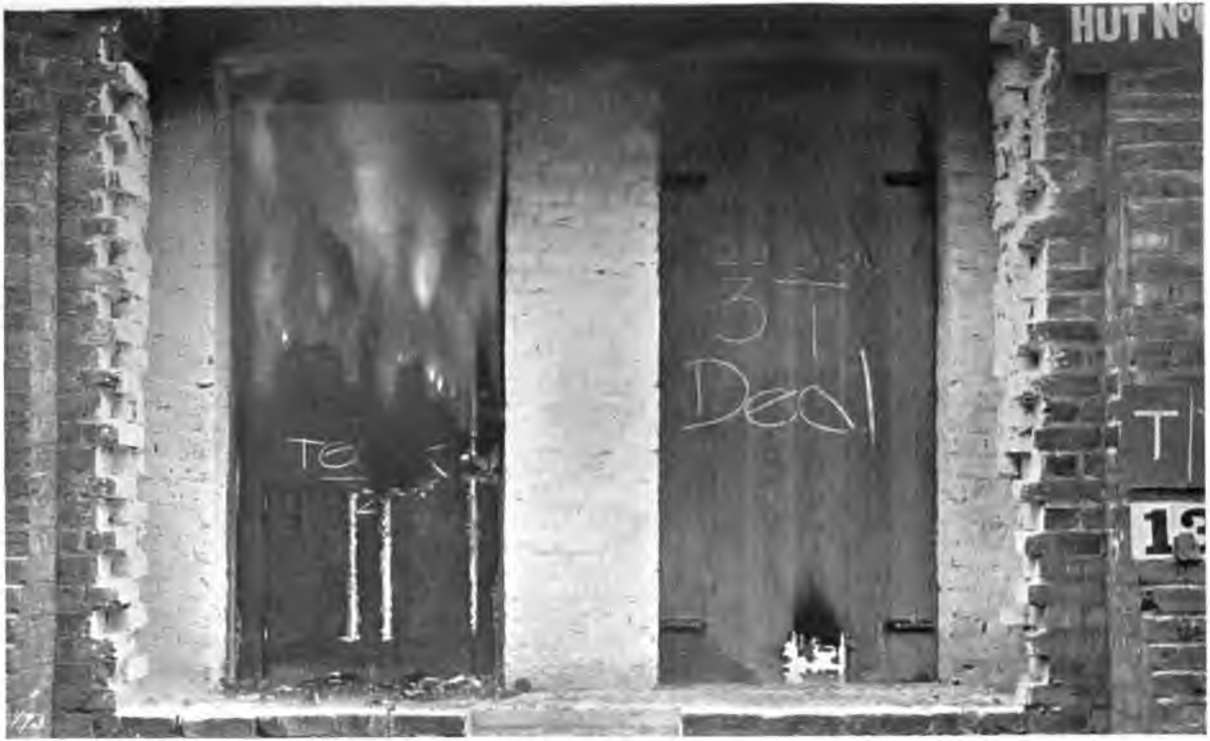

Fig. K. View of Doors showing Condition after 63 Minutes.

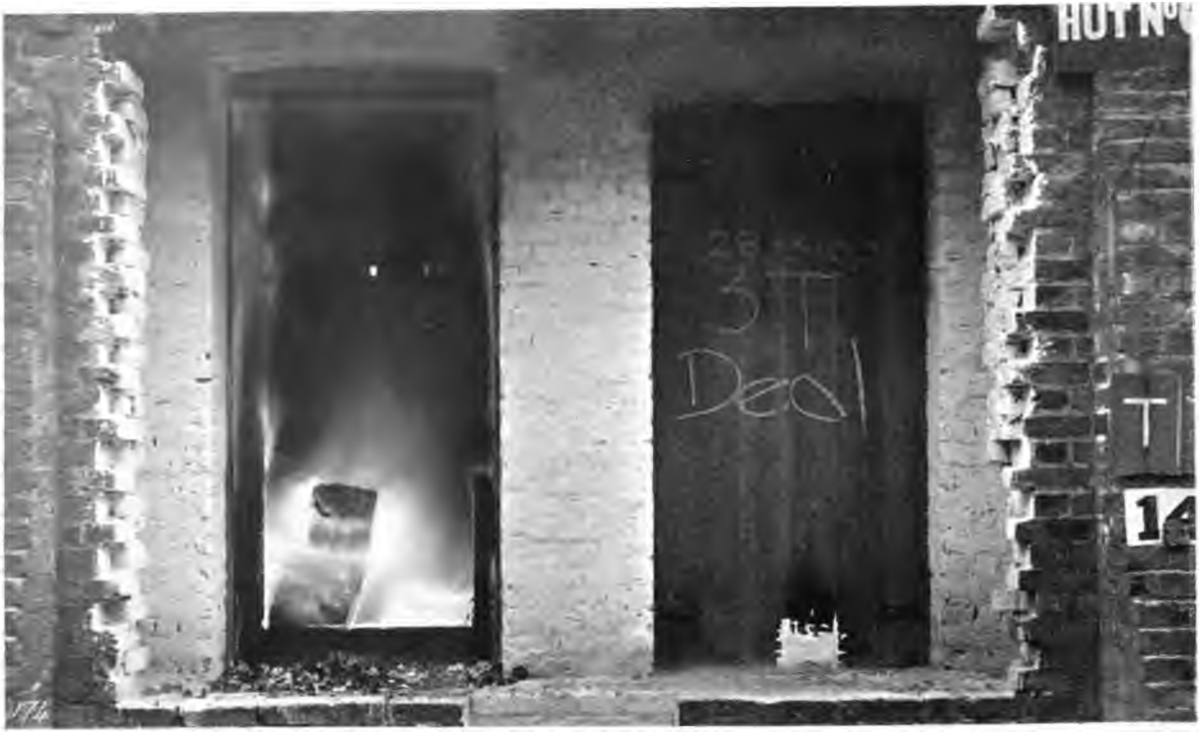

Fig. 1. VIEW OF DOORS SHOWING CONDITION AFTER 65 MINUTES.

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Mr. F. W. Hamilton, A.R.I.B.A., District Surveyor, North Fulham.
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Mr. George McDonell, A.R.I.B.A., District Surveyor, Islington.
Mr. H. McLachlan, A.R.I.B.A., District Surveyor, Western Division, City of London.
Mr. J. P. Norrington, A.M.Inst.C.E., Surveyor, Lambeth.
Mr. R. F. P. Notley, F.R.I.B.A., F.S.I., District Surveyor, Bethnal Green.
Mr. W. Weaver, M.Inst.C.E., Surveyor to the Vestry of St. Mary Abbots, Kensington.

The Commercial Section was represented by :—

Mr. F. R. Farrow, F.R.I.B.A. (Chairman).
Lieut.-Col. J. Colquhoun.
Mr. Gilbert Davenport (The Expanded Metal Co.).
Mr. J. A. King (Messrs. J. A King & Co.).
Mr. J. D. O'Brien (The Columbian Fireproofing Co.).
Mr. H. Salmon (The Expanded Metal Co.).
Mr. H. Brome Tarry (The British Uralite Co.).
Mr. J. F. Golding (The Expanded Metal Co.).
Mr. D. R. Radcliff (The Ratner Safe Co.).
Mr. Alfred Williams (Messrs. G. A. Williams & Son).

The following visitors attended by special invitation of the Executive :—

Mr. A. Howard Colls.
Mr. T. Costigan (Sec. Builders' Institute).
Mr. Coward.

Mr. Howard Dru Drury.
Mr. R. J. Friswell.
Mr. T. E. Gatehouse, F.R.S.Ed.
Mr. A. E. Buthrey.
Mr. H. E. Hamsley.
Mr. E. R. Marsland.
Mr. W. G. Perkins.
Mr. Harry Rogers.
Mr. E. S. Young.

Signed,

For the Sub-Committee conducting the Test:
MAX CLARKE (*Directing Member*).

For the Commercial Section:
FREDERIC R. FARROW.

For the Executive:
EDWIN O. SACHS (*Chairman*).

Published by the Committee as directed by the Executive.

H. S TAYLOR
(*Asst. Secretary*).

Date—October 1st, 1900.

205634

PUBLICATIONS OF THE
BRITISH FIRE PREVENTION COMMITTEE.—No. 51.

Edited by Edwin O. Sachs.

FIRE TESTS
WITH
FIRE-RESISTING CURTAINS
AND
BLINDS.

TWO FIRE BLINDS
KNOWN AS THE
"WILLIAMS" FIRE BLINDS,
INSTALLED BY
G. A. WILLIAMS & SON,
BAYSWATER, LONDON.

The Committee's Report.

LONDON, 1900.

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VIEW OF THE WINDOW AND DOOR, PROTECTED BY THE FIRE BLINDS. *Figs.* 1 *to* 6.

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26. FIRE TESTS with DOORS. A 2-in. Framed Oak Door, with 2-in. Solid Panels; a 2-in. Framed Teak Door, with 2-in. Solid Panels.
27. FIRE TESTS with PARTITIONS. A Match-boarded Partition filled in with Silicate Cotton (Slag Wool) by Messrs. T. Anderson & Son, and Messrs. T. Broadbent & Co.
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35. FIRE TESTS with DOORS. A 2-in. Framed Pitch Pine Door with 2-in. Solid Panels; a 2-in. Framed Deal Door with 2-in. Solid Panels.
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37. FIRE TESTS with PARTITIONS. A Partition erected by the "Gypsine" Brick Company, Ltd., London and Paris.
38. FIRE TESTS with FLOORS. A Floor by the "Gypsine" Brick Co., Ltd., London and Paris.
39. FIRE TESTS with DOORS. A 2-in. Framed Honduras Mahogany Door with 2-in. Solid Panels; a 2-in. Framed Poplar Door with 2-in. Solid Panels.
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Offices:

1, Waterloo Place, Pall Mall, London, S.W.

OBJECTS OF THE COMMITTEE.

The main objects of the Committee are:—

To direct attention to the urgent need for increased protection of life and property from fire by the adoption of preventive measures.

To use its influence in every direction towards minimising the possibilities and dangers of fire.

To bring together those scientifically interested in the subject of Fire Prevention.

To arrange periodical meetings for the discussion of practical questions bearing on the same.

To establish a reading-room, library and collections for purposes of research, and for supplying recent and authentic information on the subject of Fire Prevention.

To publish from time to time papers specially prepared for the Committee, together with records, extracts and translations.

To undertake such independent investigations and tests of materials, methods and appliances as may be considered advisable.

The Committee's Reports on Tests with Materials, Methods of Construction, or Appliances are intended solely to state bare facts and occurrences, with tables, diagrams, or illustrations, and they are on no account intended to read as expressions of opinion, criticisms, or comparisons.

NOTE.

In preparing this Report on Oak and Teak Doors, constructed in three thicknesses, there is little to remark beyond saying that it should be read in connection with reports on similar doors by way of comparison.

Attention, however, is called to the construction of the doors with the aid of wood pins, and that the boards were not grooved or tongued, but simply butt-jointed.

EDWIN O. SACHS.

LONDON,
December 31*st*, 1900.

THE GENERAL ARRANGEMENTS FOR TESTS.

(*MEMORANDUM.*)

The purpose of the tests undertaken by the British Fire Prevention Committee is to obtain reliable data as to the exact fire-resistance of the various materials, systems of construction, or appliances used in building practice.

The tests are of an entirely independent character, arranged on scientific lines, but with full consideration for the practical purpose in view. Absolute reliability is assured, records being mostly taken automatically or by photography, and the temperatures being easily regulated by the application of gas.

All reports on tests solely state the bare facts and occurrences, with tables, diagrams and illustrations, and on no account are reports to include expressions of opinion, nor should any expression be read as a comparison or criticism.

The general arrangement and direction of the tests are in the hands of the Executive, who act in accordance with certain principles laid down after careful study and experiment. The official tests are attended by the members of the Council and the members of the Committee in rotation.

As to the Testing Station, it comprises two houses standing in their own grounds near Regent's Park, and backing on to the Regent's Canal. The principal building is used for Committee Rooms and laboratory purposes, whilst the gardens are utilised for so-called "full-size" tests.

As to the financial aspect of the station, the establishment expenses are being met by a special subscription. As far as the funds of the Committee permit, investigations and experimental tests with ordinary (*i.e.*, not patented) forms of construction are undertaken from time to time and duly reported on. Official tests with patented materials, makers' systems, etc., etc., are subject to a scale of charges. The Testing Station is also open to members for such private research work or tests they may desire to undertake.

The services of the members participating in the management of the station, conducting or attending tests, are given entirely gratuitously.

For the Executive,

EDWIN O. SACHS, *Chairman.*

EXPERIMENTAL FIRE TESTS
CONDUCTED BY THE EXECUTIVE
OF THE

British Fire Prevention Committee.

[FOUNDED 1897.—INCORPORATED 1899.]

FIRE TESTS Fa & Ga.—APRIL, 11TH, 1900.

(Fa) A $2\frac{5}{8}$ in. Door of Oak, constructed in three thicknesses.

(Ga) A $2\frac{5}{8}$ in. Door of Teak, constructed in three thicknesses.

OBJECT OF TEST.

To record the effect of a fire of one hour and a quarter, gradually increasing to a temperature of 2,000° Fahr.

Note.—The fire was to be applied from one side, and the doors were to open inwards on to the fire side.

The door-openings were to be approximately 7 ft. by 3 ft.

SUMMARY OF EFFECT.

OAK DOOR.

In 60 minutes flame came through western corner and glow appeared at bottom of door.

In 67 minutes the boards at each side of centre joint bulged outwards $1\frac{1}{2}$ in. and joint opened.

In 75 minutes opening in the centre widened and flames came through freely; the flames at top of door had extended across the whole width.

Two of the three thicknesses had disappeared, the outer thickness remaining in position.

TEAK DOOR.

In 17 minutes flame appeared at western top corner.

In 36 minutes the flame had extended across two-thirds of top of door.

In 57 minutes glow appeared at bottom of door.

In 75 minutes flames had extended across the whole of the top of door and holes along bottom.

The inner thickness had disappeared; the centre thickness was charred through, but in position; the outer thickness had about 4 in. at the top burnt away.

DESCRIPTION OF THE TESTING PLANT.

(See Figs A, B, C *and* D.*)*

The Testing Chamber used was located at the Committee's Testing Station, and was known as No. 6 Hut.

The hut was constructed, as shown, of stock bricks with lime mortar, and measured 10 ft. by 10 ft. internally.

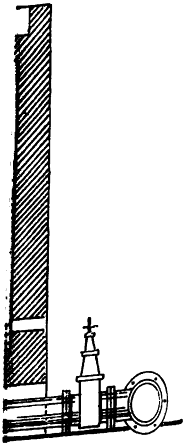
The ceiling of the hut was 9 ft., 6 in. above the pavement of the chamber, and was formed of solid wood beams grouted with fire-clay. The chamber measured 10 ft. by 7 ft. 10 in.

A brick wall, 14 in. thick, was built across the hut from east to west, 13 in. to the south of the north wall, and carried up to the ceiling; there were two openings in this, 7 ft. high and 3 ft. 3 in. wide, arched over with brick arches in two half-brick rings, and the spaces between the arches and the frames were filled in with bricks. The wall was built of gauged stuff.

The fuel used was gas produced at the station, and the supply was regulated by valves and dampers.

The gas was admitted through two mixing chambers of fire-brick, as shown.

Two Roberts-Austen pyrometers were used for recording temperatures, to take four observation records from points Nos. 1, 2, 3 and 4, points Nos. 2 and 3 being outside the doors, and the others on the fire side of the



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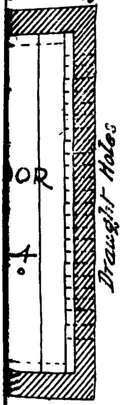


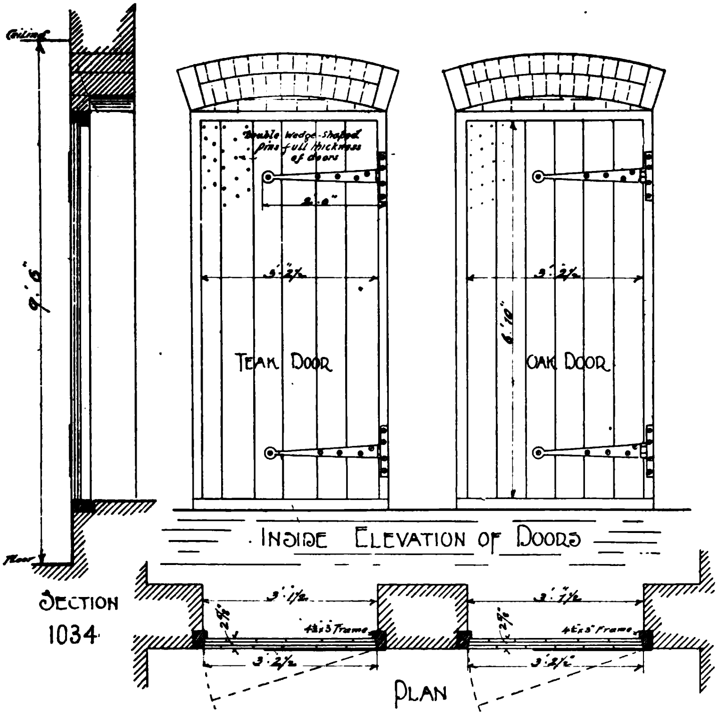
OF

doors. A continuous record was also taken from point No. 5, on the fire side.

There were observation holes on the east and west walls, closed by moveable iron shutters.

The draught holes were in the east and west walls.

The photographs were taken by daylight.



Figs. E, F. DETAILS OF DOORS.

CONSTRUCTION OF THE DOORS.

(*See Figs.* E *and* F.)

The door on the east side was of oak, and that on the west side of teak.

The doors were of the same style and constructed in the same manner, being 6 ft. 10 in. high, by 3 ft. 2½ in. wide, and formed of three thicknesses of ⅞-in. boards, between 6 in. and 7 in. wide.

The boards were not grooved or tongued, but simply butt-jointed; they were secured together by ⅜-in. double wedge-shaped wooden pins of the same material as the doors, driven through the entire thickness of the door, there being about 240 to each door.

The doors were hung with two wrought iron cross garnett hinges screwed to the doors and frames, nine 1-in. screws to each hinge, the doors were also secured on the outside with four 6-in. iron barrel bolts (two at the top and two at the bottom) to frames of the same material as the doors.

OAK. TEAK.

Fig. G. VIEW OF DOORS BEFORE COMMENCEMENT OF TEST.

The frames were 4½ in. by 3 in., rebated and splayed, as shown in the drawing (*Figs.* E *and* F), and were secured to deal plugs driven into the walls.

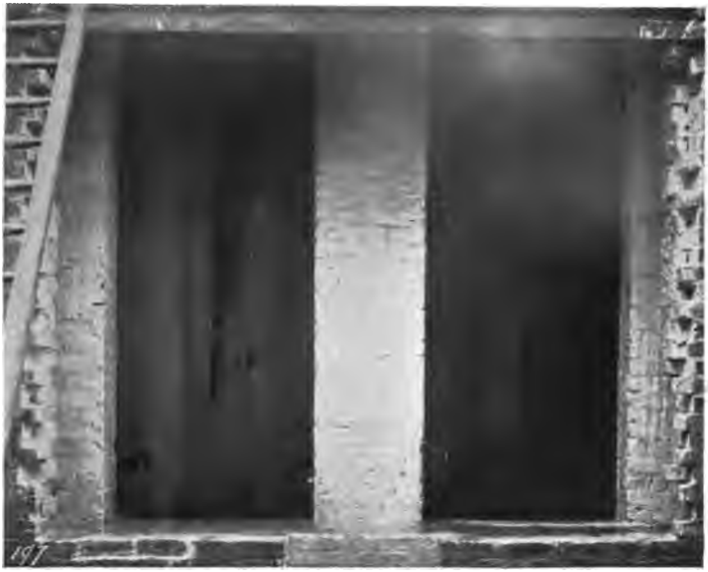
The joints of brick-work all around the frames were pointed with mortar.

THE TEST.

(*See Figs.* 1 *to* 12, *and* G *to* P.)

On April 11th, 1900, the test was undertaken. The following being the log:—

The meteorological observations taken at 3 p.m., at the Botanical Gardens, Regent's Park, read as follows:—



OAK. TEAK.

Fig. N. VIEW SHOWING CONDITION OF DOORS AT 5.21 P.M., AFTER THE APPLICATION OF WATER.

State of Weather, fair; Wind, W.S.W.; Barometer, 29·52 in.; Attached Thermometer, 53° Fahr.; Dry Bulb, 54° Fahr.; Wet Bulb, 48·5° Fahr. Remarks, South-westerly wind; fine afternoon.

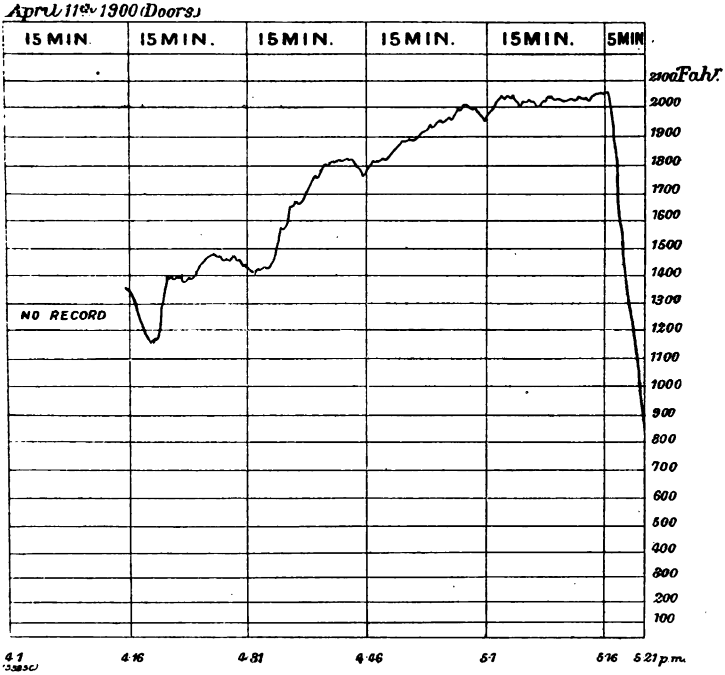
The following temperature observations were taken during the test, from points Nos. 1, 2, 3 and 4, and the diagram below shows the continuous record from point No. 5.

OBSERVATIONS TAKEN AT POINTS NOS. 1, 2, 3 & 4.

From 4.10 *p.m. to* 5.19 *p.m.—April* 11*th*, 1900.

TIME.	INSIDE.		OUTSIDE	
	NO. 1. Fahr.	NO. 4 Fahr.	NO. 2. Fahr.	NO. 3. Fahr.
4.10 p.m.	950°	900°	—	—
4.13 „	1,200°	1,300°	—	—
4.16 „	1,100°	1,150°	—	—
4.19 „	1,250°	1,400°	—	—
4.22 „	1,250°	1,380°	—	150°
4.25 „	1,350°	1,460°	—	210°
4.28 „	1,350°	1,450°	—	200°
4.31 „	1,320°	1,400°	—	175°
4.34 „	1,450°	1,520°	—	150°
4.37 „	1,600°	1,600°	—	200°
4.40 „	1,700°	1,710°	—	190°
4.43 „	1,750°	1,775°	—	190°
4.46 „	1,710°	1,750°	—	175°
4.49 „	1,800°	1,800°	—	150°
4.52 „	1,800°	1,800°	—	150°
4.55 „	1,880°	1,880°	—	140°
4.58 „	1,900°	1,900°	—	150°
5.1 „	1,900°	1,900°	—	200°
5.4 „	1,940°	1,940°	—	210°
5.7 „	1,950°	1,950°	—	250°
5.10 „	1,950°	1,960°	—	300°
5.13 „	1,950°	1,970°	—	460°
5.16 „	1,960°	1,980°	175°	600°
5.19 „	14,00°	1,500°	250°	600°

AUTOMATIC RECORD AT POINT NO. 5.



Wednesday, April 11*th*, 1900.

OAK DOOR.

At 4.1 p.m. gas lighted.
Observations from the outside.

At 4.7 p.m. smoke came through the joint between top of door and frame.

At 4.20 p.m. moisture exuded along top of door, and also slightly on upper part of west side.

TEAK DOOR.

At 4.1 p.m. gas lighted.
Observations from the outside.

At 4.7 p.m. smoke came through the joint between top of door and frame.

At 4.18 p.m. (17 minutes) flame appeared at western top corner of door. (See Fig. H, 4.22 p.m., and Fig. 3, 4.22 p.m.—21 minutes.)

At 4.30 p.m. moisture exuded also along bottom of door.

At 4.40 p.m. more moisture at top and bottom of door, but not at west side. Smoke issuing from western top corner.

At 4.48 p.m. moisture at bottom and east side of door, and also exuding through pins all over the door. The door had warped away from rebate, $\frac{3}{8}$ in. at centre of east side, $\frac{3}{16}$ in. at centre of west side.

At 5.1 p.m. flame first came through top western corner, and glow appeared at bottom of door near eastern corner. (See Fig. J, 5.1 p.m.—60 minutes, also Fig. 9, 5.2 p.m.)

At 4.30 p.m. flame continued, but not so fiercely as at first. Oil exuded down the west side.

At 4.35 p.m. flame had extended across two-thirds of top of door, and 4 inches down west side. (See Fig. 5, 4.37 p.m.—36 minutes.)

At 4.40 p.m. flame had lessened.

At 4.50 p.m. flames continued to issue from western corner. (See Figs. 6 and 7, 4.47 p.m. and 4.52 p.m.)

At 4.57 p.m. one flash of flame appeared below bolt at lower western corner.

At 4.58 p.m. glow appeared through centre of bottom of door, and at lower western corner.

At 5.1 p.m. the glow at centre had become stronger, and that at western corner had developed into a hole. (See Fig. J., 5.1 p.m.—60 minutes.)

At 5.8 p.m. flames at top western corner; strong glow all along bottom of door.

Five holes appeared down the centre joint of outer thickness, the two centre boards bulging outwards 1½ ins. at centre joint.

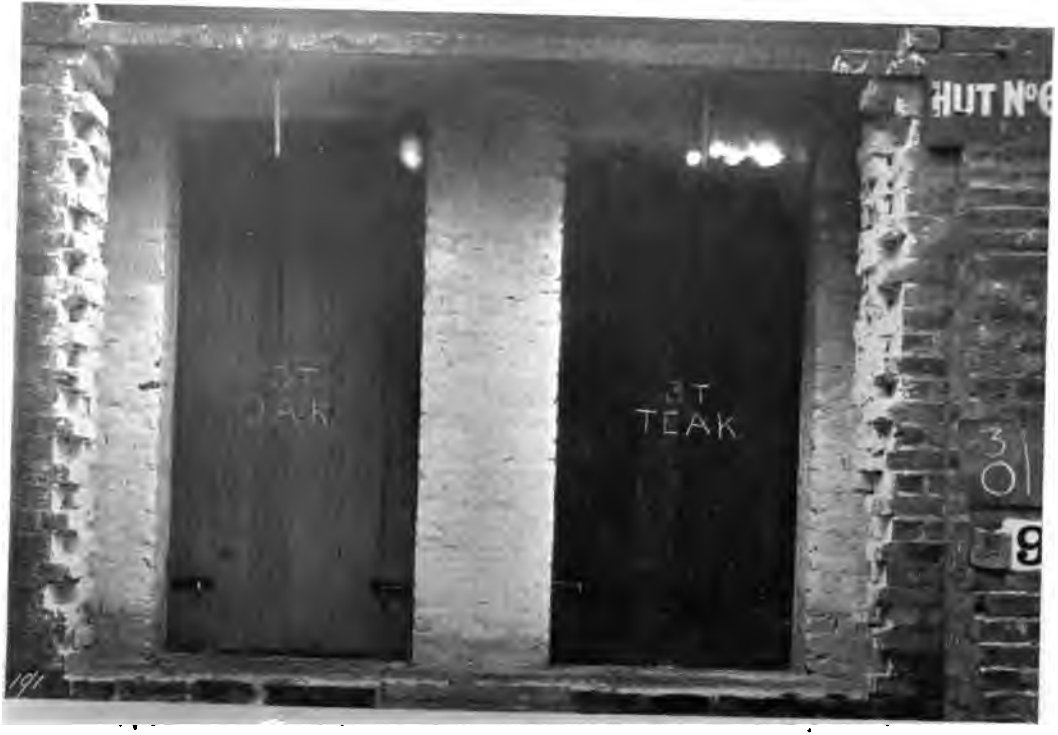
At 5.13 p.m. flames had extended half way along top, and also appeared at eastern top corner.

Flame came through parts of centre joint, the three upper holes having extended and joined; the lower two holes in centre joint remaining as a strong glow.

The glow along bottom of door had become stronger. (See Figs. K, 5.10 p.m.—69 minutes; also L, 5.13 p.m. —72 minutes; and Fig. 11, 5.12. p.m.)

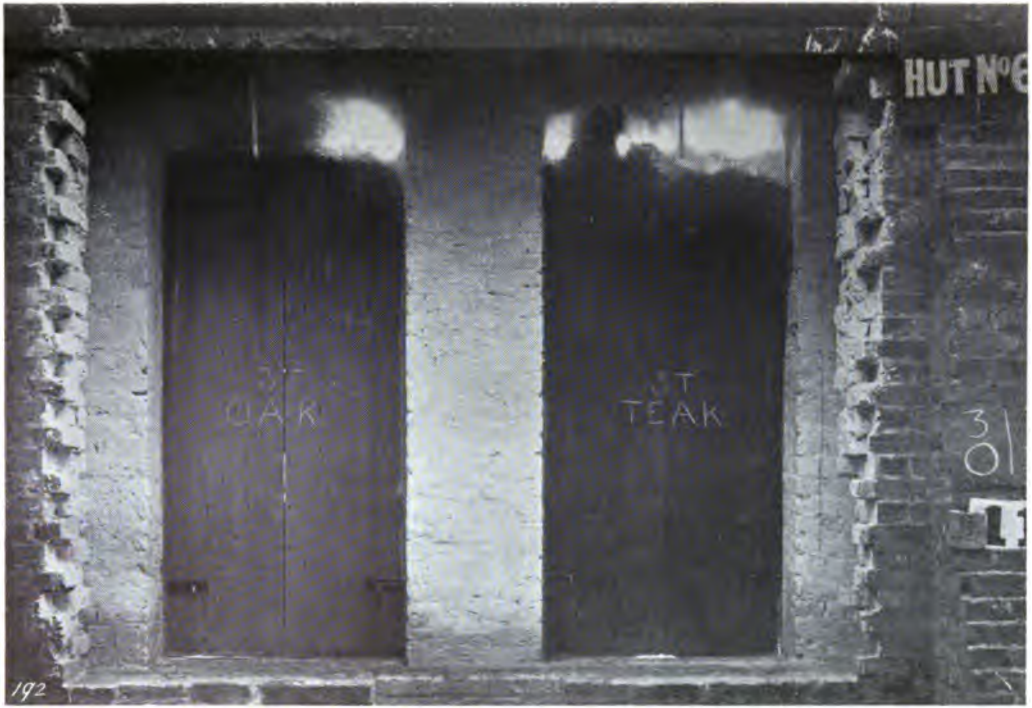
At 5.10 p.m. flame at top of door had increased considerably. Both glow spots at bottom had developed into holes. (See Fig. K, 5.10 p.m.—69 minutes; also Fig. 11, 5.12. p.m)

At 5.15 p.m., in addition to the above, a hole had appeared at eastern lower corner. (See Fig. M, 5.16 p.m.—75 minutes; also Fig. 12, 5.17. p.m.)



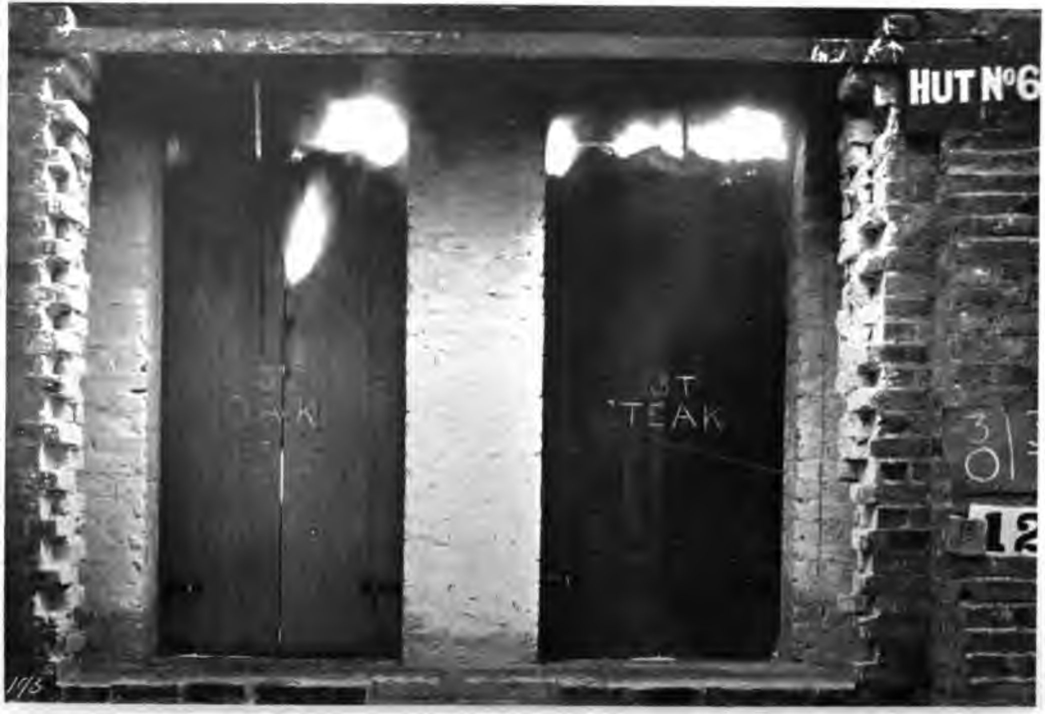
Oak. Teak.

Fig. 3. View Showing Condition of Doors after 60 Minutes.



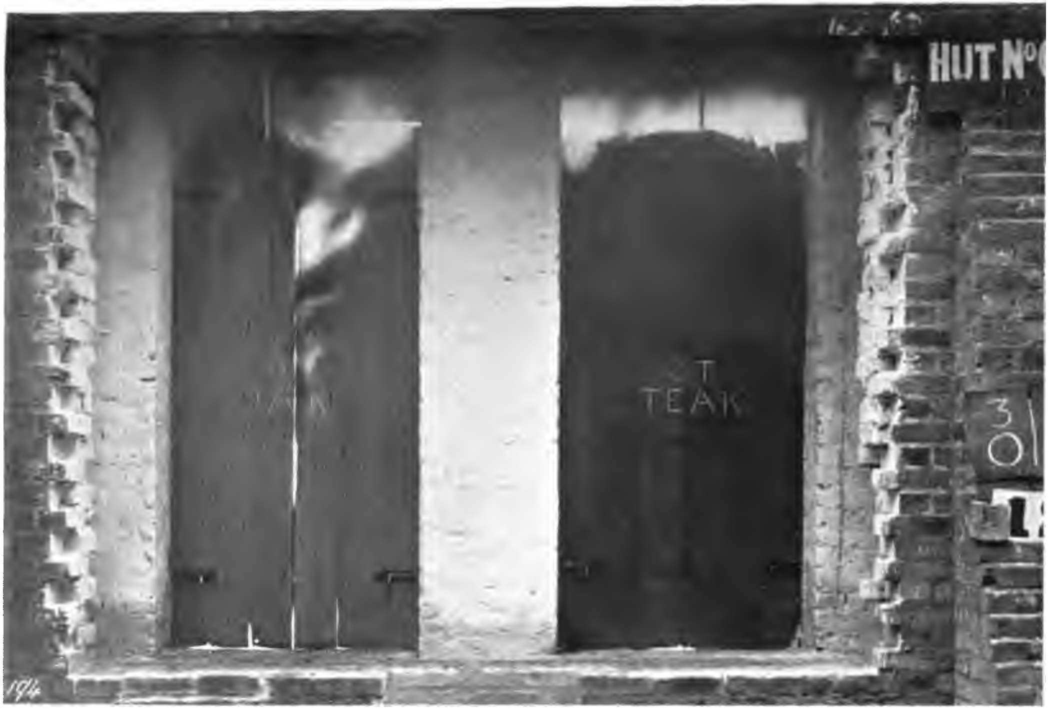
Oak. Teak.

Fig. K. View Showing Condition of Doors after 69 Minutes.



Oak.   Teak.

Fig. 1. View Showing Condition of Doors after 72 Minutes.



Oak. Teak.

Fig. M. View Showing Condition of Doors after 75 Minutes.

At 5.16 p.m. opening of centre joint widening, and flames coming through freely. (See Fig. M, 5.16 p.m. — 75 minutes; also Fig. 12, 5.17. p.m.)

At 5.16 p.m. gas shut off.

At 5.17 p.m. water applied.

At 5.16 p.m. gas shut off.

At 5.17 p.m. water applied.

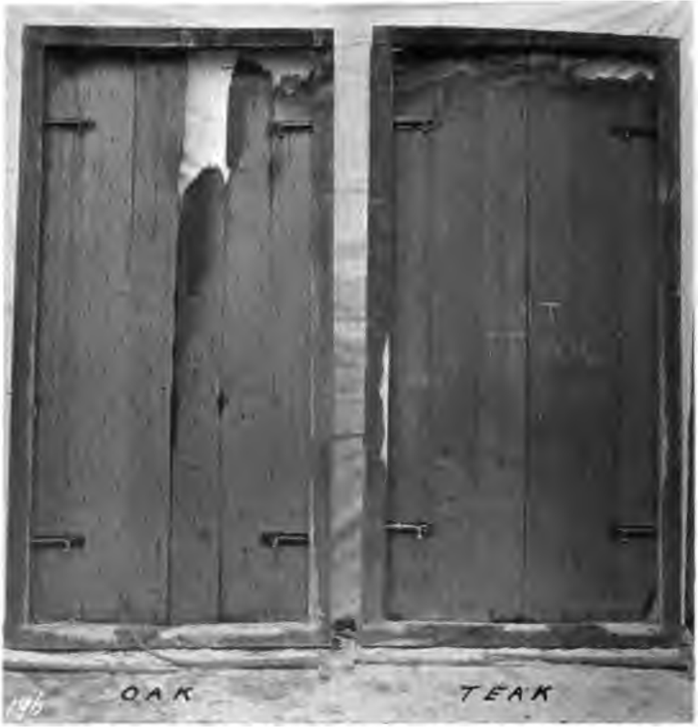


Fig. o. View Showing Condition of the Outside of Doors after Test and Removal.

Observations on the inside.

At 4.7 p.m. door well alight, excepting at eastern lower corner.

Observations on the inside.

At 4.7 p.m. door well alight, excepting at eastern lower corner.

At 4.12 p.m. blazing all over.

At 4.12 p.m. blazing all over.

Note.—From about 4.10 p.m. to about 4.30 p.m., at intervals, it was noticed that sometimes one door, and sometimes the other, presented a charred black appearance without any sign of ignition; these intervals were succeeded by times when the doors would become again ignited and covered with flames.

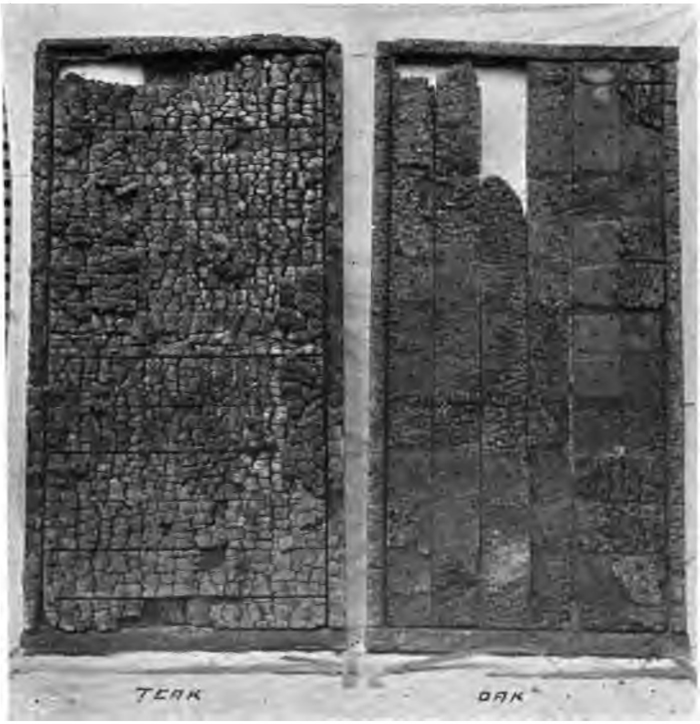


Fig. P. View Showing Condition of the Inside of Doors after Test and Removal.

After about 4.30 p.m. this phenomenon ceased, and both doors appeared to burn continuously on the inside.

At 4.30 p.m. burning freely.	At 4.30 p.m. burning freely.
At 4.45 p.m. the inner thickness appeared to be burnt through, and the charred particles began to curl up.	At 4.45 p.m. the inner thickness had the appearance of being charred through, but the surface had not begun to disintegrate.
At 4.48 p.m. charred particles of inner thickness began to fall off.	
At 5.0 p.m. nearly all of inner thickness had disappeared, the centre thickness being much charred, but still retaining its form.	At 5.0 p.m. some of inner thickness had fallen, but not more than about one half.
At 5.7 the lower hinge was quite detached from door.	At 5.7 the lower hinge had buckled, the end being detached from door (it fell soon afterwards).
At 5.10 lower hinge had fallen off.	

Note.—The upper hinges of both doors fell off before conclusion of test: the inside of hut was so full of flame that the hinges were not visible after 5.10.

OBSERVATIONS AFTER TEST.

(See Figs. N, O *and* P.*)*

OAK DOOR.	TEAK DOOR.
The whole of the inner thickness had disappeared.	The whole of the inner thickness had disappeared, excepting one small piece of charred wood on eastern (hinge) side.
The centre thickness had also gone, with the exception of a few pieces of charred particles on the eastern (hinge) side.	The centre thickness was in position, but was almost entirely charred.

The outer thickness remained in position, most of its inner surface being charred, the outer surface being intact, excepting the upper portions of three boards. (See Figs. O and P.)

The frame was deeply charred, especially at the head, the sill being not much damaged.

The outer thickness was practically unharmed except for about 4 ins. at the top, where flames had broken through, and for small holes at eastern lower corner, and at centre of bottom of door. (See Figs. O and P.)

The frame was deeply charred, especially at the head, the sill being not much damaged.

GENERAL ARRANGEMENTS.

The test was carried out according to the procedure laid down by the Executive for investigations of this description and conducted by a Sub-Committee of the Executive, comprising:—

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Mr. Ellis Marsland, District Surveyor, Camberwell.
Mr. F. Hammond, F.R.I.B.A., District Surveyor, East Hampstead.

Mr. Thomas Kissack, Resident Engineer at the Testing Station, assisted the Sub-Committee.

The Executive was represented by:—

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Mr. Max Clarke, A.R.I.B.A.
Mr. Matt Garbutt, A.M.I.C.E., A.R.I.B.A.

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Mr. J. Howard Colls.
Mr. H. H. Ray.

The Fireproof Partition Syndicate was represented by:—

Mr. T. I. Cammell, Mr. H. L. Cunnah, Mr. Howard Payne, Dr. G. S. Street, Mr. George Traill.

The following visitors attended by special invitation of the Executive:—

Mr. P. Stransom, Architect's Department, L.C.C.; Mr. Robert Robertson, Architect's Department, L.C.C.; Mr. W. G. Perkins, Architect's Department, L.C.C.; Mr. P. G. Killick, Vestry Surveyor, Clerkenwell; Mr. J. Rush Dixon, Vestry Surveyor, Shoreditch; Mr. W. Busbridge; Mr. W. Buchan.

Signed,

For the Sub-Committee conducting the Test:

CHAS. E. GOAD (*Directing Member*).

For the Commercial Section:

FREDERIC R. FARROW.

For the Executive:

EDWIN O. SACHS (*Chairman*).

Published by the Committee as directed by the Executive.

H. S. TAYLOR
(Asst. Secretary).

Date—December 31st, 1900.

PUBLICATIONS OF THE

BRITISH FIRE PREVENTION COMMITTEE—No. **55.**

Edited by Edwin O. Sachs.

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FIRE TESTS WITH FLOORS.

A FLOOR
OF
DEAL JOISTS AND COKE BREEZE CONCRETE, WITH EXPANDED METAL AND PLASTER CEILING.

Particulars
OF
EXPERIMENTAL FIRE TEST.

LONDON, 1900.

PUBLISHED AT THE OFFICES OF
THE BRITISH FIRE PREVENTION COMMITTEE
(Founded 1897—Incorporated 1899.)
1, WATERLOO PLACE, PALL MALL.

the

SH FIRE PREVENTION COMMITTEE.—No. 55.

n O. Sachs.

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OBJECTS OF THE COMMITTEE.

The main objects of the Committee are:—

To direct attention to the urgent need for increased protection of life and property from fire by the adoption of preventive measures.

To use its influence in every direction towards minimising the possibilities and dangers of fire.

To bring together those scientifically interested in the subject of Fire Prevention.

To arrange periodical meetings for the discussion of practical questions bearing on the same.

To establish a reading-room, library and collections for purposes of research, and for supplying recent and authentic information on the subject of Fire Prevention.

To publish from time to time papers specially prepared for the Committee, together with records, extracts, and translations.

To undertake such independent investigations and tests of materials, methods and appliances as may be considered advisable.

The Committee's Reports on Tests with Materials, Methods of Construction, or Appliances are intended solely to state bare facts and occurrences, with tables, diagrams, or illustrations, and they are on no account intended to read as expressions of opinion, criticisms, or comparisons.

NOTE.

In the report presented herewith the effect of a fire of two hours duration is recorded in respect to a floor of ordinary soft wood joists filled in with concrete, the concrete, however, affording protection to the joists from below, and the soffit comprising a plaster ceiling on "expanded metal" lathing, this lathing having at the same time been employed for purposes of construction in the place of the usual centering which is generally applied where concrete fillings are specified.

This report should be read in conjunction with the reports on floors where ordinary iron or wood joists were used without a protective covering.

EDWIN O. SACHS.

LONDON,
May 4*th*, 1900

THE GENERAL ARRANGEMENTS FOR TESTS.

(*MEMORANDUM.*)

The purpose of the tests undertaken by the British Fire Prevention Committee is to obtain reliable data as to the exact fire-resistance of the various materials, systems of construction, or appliances used in building practice.

The tests are of an entirely independent character, arranged on scientific lines, but with full consideration for the practical purpose in view. Absolute reliability is assured, records being mostly taken automatically, or by photography, and the temperatures being easily regulated by the application of gas.

All reports on tests solely state the bare facts and occurences, with tables, diagrams and illustrations, and on no account are reports to include expressions of opinion, nor should any expression be read as a comparison or criticism.

The general arrangement and direction of the tests are in the hands of the Executive, who act in accordance with certain principles laid down after careful study and experiment. The official tests are attended by the members of the Council and the members of the Committee in rotation.

As to the Testing Station, it comprises two houses standing in their own grounds near Regent's Park, and backing on to the Regent's Canal. The principal building is used for Committee Rooms and laboratory purposes, whilst the gardens are utilised for so-called "full-size" tests.

As to the financial aspect of the station, the establishment expenses are being met by a special subscription. As far as the funds of the Committee permit, investigations and experimental tests with ordinary (*i.e.*, not patented) forms of construction are undertaken from time to time and duly reported on. Official tests with patented materials, makers' systems, etc., etc., are subject to a scale of charges, but these charges are so figured as to only just cover the actual cost. Any surplus is refunded. The Testing Station is also open to members for such private research work or tests they may desire to undertake.

The services of the members participating in the management of the station, conducting or attending tests, are given entirely gratuitously.

For the Executive,

EDWIN O. SACHS, *Chairman*

EXPERIMENTAL FIRE TESTS

CONDUCTED BY THE EXECUTIVE

OF THE

British Fire Prevention Committee.

[FOUNDED, 1897.—INCORPORATED, 1899.]

FIRE TEST No. Fa.—MARCH, 28TH, 1900.

A Floor of Deal Joists and Coke Breeze Concrete, with Expanded Metal and Plaster Ceiling.

OBJECT OF TEST.

To record the effect of a fire of two hours, commencing with a temperature of 500° Fahr., gradually increasing to a temperature not exceeding 2,300° Fahr., followed by the application of a stream of water for two minutes.

Note.—The area of the floor under investigation was to be 100 feet superficial in the clear (10 ft. by 10 ft.).

The floor was to be loaded with 100 lbs. per foot distributed.

The time allowed for construction and drying was four weeks (Winter).

SUMMARY OF EFFECT.

In 28 minutes plaster began to fall in patches from the ceiling, and continued to fall at intervals till the end of the test, when water was applied and further plaster was washed away.

No other effect of the fire was noticeable, and at the conclusion of the test the floor was intact and carried its load.

DESCRIPTION OF TESTING PLANT.

(*See Figs.* 1 *to* 4.)

The testing chamber was located at the Committee's Testing Station, and was known as "No. 2 Hut."

The chamber was constructed, as shown, of stock bricks with lime mortar, and measured 10 ft. by 10 ft. internally.

The ceiling of the floor tested was 7 ft. 6 in. above the pavement of the chamber.

The door-opening on the south side measured 2 ft. 6 in. by 6 ft. 6 in., and was bricked up on the morning of the test.

The fuel used was gas produced at the station, and the supply was regulated by valves and dampers.

The gas was admitted through two mixing chambers of fire-brick, each 10 ft. by 3 ft., as shown.

Two Robert-Austen pyrometers were used for recording temperatures, the first to take a continuous record from point No. 5, and the second to take four observation records from points 1, 2, 3, and 4.

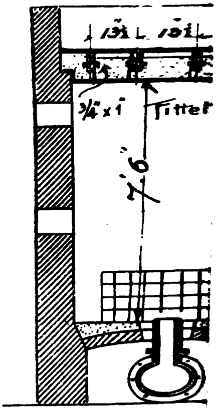
The load was of bricks, distributed evenly over the surface of the floor.

There were two observation holes in the north wall, one in the east wall, one in the west wall and one in the south wall in door-opening.

The draught holes were in the east and west walls.

The photographs were taken partly by daylight and partly by flashlight.

The stream of water was applied through a branch with ½-in. nozzle, and supplied from a manual fire-engine equipped with a pressure gauge.



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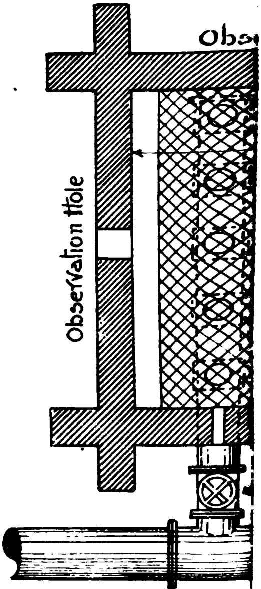

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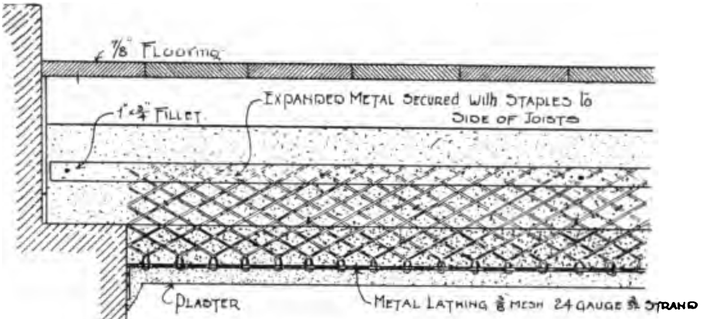
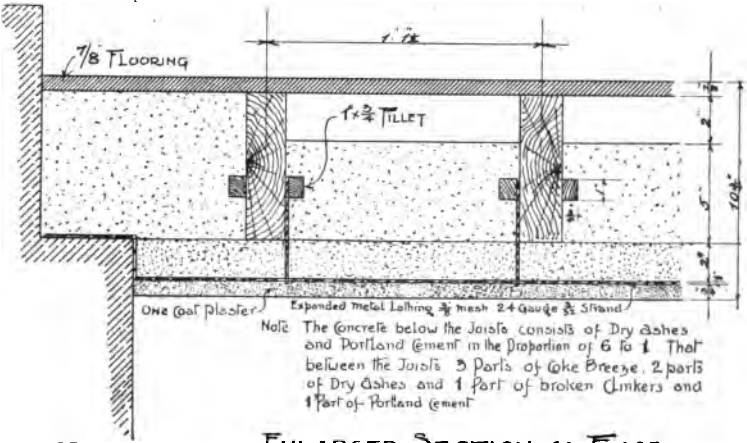
CONSTRUCTION OF THE FLOOR.

(*See Figs.* 1 *to* 5.)

The construction of the floor, illustrated in Figs. 1 to 5, was as follows:—


7/8" Flooring
Expanded Metal Secured with Staples to Side of Joists
1"×3/4" Fillet
Plaster
Metal Lathing 3/8 mesh 24 Gauge 3/32 Strand

ENLARGED SECTION OF FLOOR



Note The Concrete below the Joists consists of Dry ashes and Portland Cement in the Proportion of 6 to 1 That between the Joists 3 Parts of Coke Breeze, 2 parts of Dry ashes and 1 Part of broken Clinkers and 1 Part of Portland Cement

ENLARGED SECTION OF FLOOR

THE FLOOR. *Fig. 5.* DETAILS.

On February 27th the nine joists supporting the floor and consisting of second quality fir, 2 in. by 7 in., spaced

13½ in. centre to centre, were fixed; they ran north and south, and rested on the offsets of the walls, 4½ in. at each end.

On one side of each joist, and running the whole length, a strip of expanded metal, 5 in. deep, ¾ in. mesh, 16 gauge, was secured with 1 in. staples. This was brought below the joists 2 in., and the strands of the lower mesh were cut in two and bent back, forming a hook for the support of the lathing used for ceiling and centering (see Fig. 5).

On each side, and along the whole length of each joist, a 1 in. by ¾ in. wood fillet was nailed, two inches from the lower edge.

On March 1st, expanded metal lathing was fixed, and used both for the centering and to carry the plaster of ceiling. This was in widths of 2 ft. 3 in., and known as No. 1 lathing, ⅜ in. mesh, 24 gauge, $\frac{3}{32}$ strand.

This horizontal lathing was secured to the vertical strips of lathing, nailed to the joists before mentioned, by cutting and bending the strands of the lower mesh, and it was further secured with No. 18 gauge galvanized iron wire (see Fig. 5).

The concrete below the joists was then filled in. This was 2 in. thick, and made of small dry ashes and Portland cement, in the proportion of six parts of ashes to one part of cement. It was turned over four times dry and four times wet, 34·50 gallons of water being used to ¾ yd. of material.

It was carried to the floor in buckets, emptied, and spread over the surface and well pushed under the joists with a trowel.

On March 6th the concrete between the joists was put in. This was 5 in. thick, made in the proportion of three parts of coke breeze, two parts of dry ashes, one part of clinkers broken sufficiently small to pass a 1 in. mesh, and incorporated with one part of Portland cement. It was mixed four times dry and four times wet, 21.55 gallons of water being used to each $\frac{3}{4}$ yd. of material. The ashes and clinkers before being used were quite dry, the coke breeze being slightly damp.

The concrete was carried to the root in buckets, emptied, and spread over the surface between the joists and stamped down lightly with the feet, and levelled with a trowel.

The hut was covered with a tarpaulin, until March 21st, when it was removed to enable the deal flooring to be laid. This was $\frac{7}{8}$ in. thick and in 6-in. widths, nailed to joists with floor brads, two nails to each joist. After the flooring was laid the hut was again covered with a tarpaulin until the morning of the test.

On March 12th the ceiling was plastered one coat. The coarse stuff, supplied by a local contractor, ready made, was stated to consist of lime, sand, and hair, in the proportion of 1 yd. of sand, 6 bushels of lime, and 14 lbs. of hair.

Owing to the uneven surface of the lathing, caused by the weight of concrete above, some parts of the ceiling were thicker than others, and the plaster averaged at least 1 in. thick.

On March 13th one coke fire was put into the hut and kept in all day, and on the following day the plasterer went over the ceiling with a "float." The floor was then left until the test began.

On March 19th one coke fire was lighted in the hut and was kept in daily till March 24th.

Note.—The 7 inches of concrete when dry weighed about 40 lbs. per foot super. The weight per cubic foot was about 67 lbs.

On March 6th, during the operation of concreting, the weather report was as follows:—State of weather, overcast; Rain, none; Wind, N.N.W.; Barometer, 30·18 in. Attached Thermometer, 42° Fahr.; Dry Bulb, 38° Fahr.; Wet Bulb, 35·2° Fahr.; Remarks, dry afternoon, very cold.

During March the rainfall for the month (taken at Camden Square) was ·79 inches, with a maximum of ·41 inches on March 18th. The maximum temperature was 58·6° Fahr. (March 12th); minimum, 23·4° Fahr. (March 18th).

PREPARATIONS FOR THE TEST.

On March 26th and 27th, the area of the floor, to an extent of 81 square feet, was loaded with bricks weighing 8,100 lbs., making a load equal to 100 lbs. per square foot.

THE TEST.

On March 28th the test was undertaken. The following is the log of the test:—

At 3.37 p.m. the floor was intact.

At 3 p.m. the Meteorological observations taken at he Botanic Gardens, Regent's Park, read as follows:—

State of weather, overcast; Rain, none; Wind, N.N.E.; Barometer, 29·54 in.; Attached Thermometer, 43° Fahr.; Dry Bulb, 39·2° Fahr.; Wet Bulb, 36·8° Fahr.; Remarks, dull afternoon, cold, hazy.

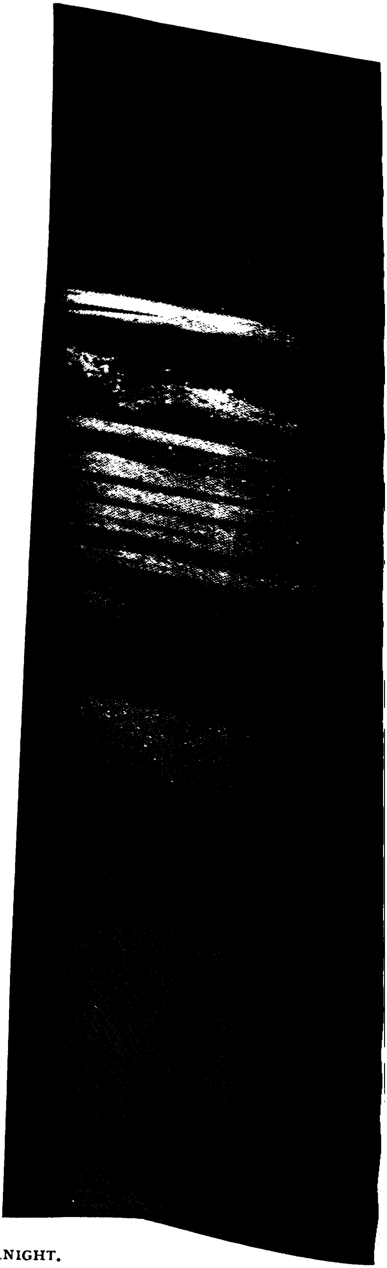
The table and diagram given below show the temperatures taken from the five pyrometer observation points in the hut, as shown on the drawings as Nos. 1, 2, 3 and 4, and one automatic record from point No. 5.

OBSERVATIONS TAKEN AT POINTS NOS. 1, 2, 3 AND 4.

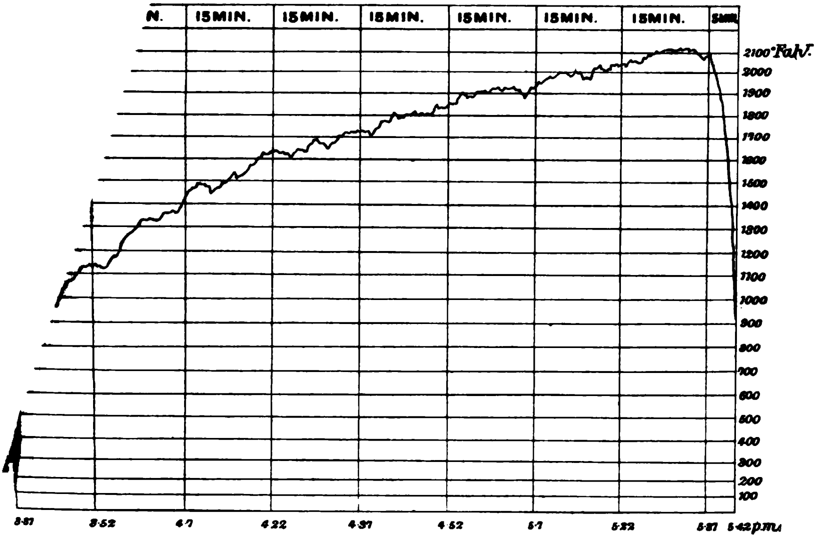
From 3·51 *p.m. to* 5·41 *p.m.*

TIME.	No. 1	No. 2	No. 3	No. 4
	Fahr.	Fahr.	Fahr.	Fahr.
3·51 p.m.	675°	700°	800°	650°
3·56 „	875°	980°	980°	850°
4·1 „	1,000°	1,125°	1,150°	950°
4·6 „	1,120°	1,200°	1,300°	1,070°
4·11 „	1,200°	1,275°	1,360°	1,150°
4·16 „	1,320°	1,400°	1,550°	1,280°
4·21 „	1,375°	1,450°	1,550°	1,300°
4·26 „	1,470°	1,520°	1,700°	1,400°
4·31 „	1,500°	1,550°	1,700°	1,450°
4·36 „	1,530°	1,610°	1,750°	1,500°
4·41 „	1,600°	1,640°	1,800°	1,550°
4·46 „	1,650°	1,680°	1,860°	1,600°
4·51 „	1,700°	1,720°	1,900°	1,640°
4·56 „	1,700°	1,750°	1,900°	1,650°
5·1 „	1,780°	1,800°	1,960°	1,720°
5·6 „	1,820°	1,840°	1,960°	1,750°
5·11 „	1,900°	1,900°	2,000°	1,800°
5·16 „	1,900°	1,900°	2,020°	1,800°
5·21 „	1,920°	1,950°	2,050°	1,850°
5·26 „	2,000°	2,000°	2,080°	1,900°
5·31 „	2,000°	2,025°	2,100°	1,900°
5·36 „	2,000°	2,020°	2,100°	1,900°
5·41 „	1,500°	1,100°	750°	1,200°

THE FLOOR. *Fig.* 7. VIEW FROM BELOW AFTER TEST.



NIGHT.



At 3.37 p.m. the gas was lighted.

At 4.5 p.m. about 1½ ft. super of plaster had fallen from the ceiling at the N.W. corner, exposing the metal lathing. The centre of the fallen patch was about 2 ft. 3 ins. from the west wall and 9 ins. from the north wall.

At 4.9 p.m. two more pieces of plaster had fallen, one piece, having an area of about 1 ft., close to the centre of the north wall, and the other piece, about 2 ft. in area, in the N.E. corner.

At 4.12 p.m. the plaster to ceiling all along the north side of hut and about 12 ins. from the north wall was in a damaged condition.

At 4.15 p.m. the plaster to ceiling for a width of about 12 ins. from the east and west walls bulging and blowing off, but only the surface affected, the lathing not being exposed.

Also a piece of plaster about 2 ft. by 9 ins. had fallen from the ceiling, about 2 ft. away from south wall, exposing the lathing.

At 4.19 p.m. a piece of plaster about 9 ins. by 9 ins. had fallen from the S.W. corner, and a blister was forming against the wall.

At 4.20 p.m. the plaster to ceiling all along the south side of hut and about 12 ins. from south wall was blistered and damaged.

At 4.25 p.m. the margin of the ceiling, about 12 ins. all round the hut, had its surface destroyed, but the centre part was generally unaffected, with the exception before mentioned at 4.15 p.m.

At 4.27 p.m. a blister forming in plaster, having its centre about 4 feet from east wall and 3 feet from south wall, and with a crack about 12 ins. long running east and west.

At 4.38 p.m. steam arising in considerable volume from the upper surface of floor at junction with north wall, and a little smoke arising from a corresponding position on the west.

At 4.45 p.m. a thermometer placed on the top surface of the concrete under the boards at the N.W. corner registered 80° Fahr.

At 4.53 p.m. the same thermometer registered 98°. The blister on ceiling referred to at 4.15 p.m., extending towards S.W. corner, and the plaster dropping off, exposing the metal lathing.

At 4.55 p.m. the external thermometer registered 120°.

At 5.20 p.m. the external thermometer registered 160°.

At 5.37 p.m. the gas was turned off.

At 5.39 water was applied to the soffit of floor through a half-inch jet at about 20 lbs. pressure. The effect of this was to wash the plaster off the ceiling where it was struck by the water, exposing the metal lathing.

At 5.41 p.m. the water was shut off and the test concluded.

Note.—The floor at the conclusion of the test showed little, if any, deflection.

OBSERVATIONS AFTER TEST.

(See Figs. 6, 7 *and* 8*).*

On March 29th the load was removed. It was found that the wooden joists had ignited, and the floor boards were burnt through in patches (see Fig. 6).

Note.—The fire had been smouldering all night, and water was applied to extinguish it.

The photographs shown in Figs. 6 to 8 were taken.

On the same day at 4 p.m. some of the floor boards were removed and the wooden joists examined.

It was found that all the joists had been more or less damaged by the fire smouldering all night, portions of them were quite consumed, leaving the matrix only in the concrete.

The least damaged of the 9 joists forming the floor was the centre one, and this was intact but for a piece about 12 inches long and 5 inches deep, which was consumed about 15 inches distant from south end.

The floor had deflected 2¾ inches.

On examining the soffit it was found that all the plaster had fallen, with the exception of about half-a-yard at the S.W. corner.

The metal lathing was exposed and a patch about 12 inches by 6 inches by the N.W. corner was found to be partly fused.

There were straight joints in the lower 2 inches of concrete in line with the vertical pieces of expanded metal fixed to the sides of the joists, to which the horizontal lathing was hung. The two inches of concrete, formed of dry ashes and Portland cement, was loose and disintegrated, but the remainder of the concrete was sound and unaffected by the fire.

GENERAL ARRANGEMENTS.

The test was carried out in accordance with the pro cedure laid down by the Executive for investigations of this description, and conducted by a Sub-Committee, comprising:—

Mr. Ellis Marsland, District Surveyor, Camberwell.
Mr. Max Clarke, A.R.I.B.A.
Mr. Matt. Garbutt, A.R.I.B.A., A.M. Inst. C.E.

Mr. Thomas Kissack, Resident Engineer at the Testing Station, assisted the Sub-Committee.

Mr. H. B. White, M.I.E.E., superintended the instrument room.

The Council was represented by:—

Sir John Taylor, K.C.B., H.M. (Office of Works).
Mr. Arthur Cates, F.R.I.B.A. (late Surveyor Crown Estates).

The Executive was represented by:—

Mr. Edwin O. Sachs (Chairman).
Mr. Chas. E. Goad, M.Am.Soc.C.E.
Mr. F. Hammond, F.R.I.B.A., District Surveyor E. Hampstead.

The Members' Testing Sub-Committee was represented by Mr. G. E. Monckton, M.A.

The Commercial Section was represented by:—

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Mr. D. R. Ratcliffe (The Ratner Safe Co.).
Mr. A Williams (G. A. Williams & Son).
Mr. Gilbert Davenport (The Expanded Metal Co.).

The general body of members was represented by:—

Mr. J. F. Dyer, Vice-Pres. National Fire Brigades' Union.
Mr. F. S. Capon, Architect's Dept., L.C.C.
Mr. Arthur Crow, A.R.I.B.A. (District Surveyor, Whitechapel).
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Mr. J. P. Norrington, A.M. Inst. C.E. (Surveyor, Lambeth).
Mr. W. Weaver, M. Inst. C.E. (Surveyor, Kensington).
Mr. F. E. Eiloart.
Mr. A. Fernhead.

The following visitors attended by special invitation of the Executive :—

Mr. A. E. Buthrey, Mr. A. Howard Colls, Mr. T. Costigan (Sec. Builders' Institute), Mr. Coward, Mr. Howard Dru-Drury, Mr. Friswell, Mr. T. E. Gatehouse, F.R.S. Ed., Mr. Hamsley, Mr. E. R. Marsland, Mr. W. G. Perkins, Mr. H. Rogers, Mr. E. S. Young.

Signed,

For the Sub-Committee conducting Test :

ELLIS MARSLAND (*Directing Member*).

For the Commercial Section :

FREDERIC R. FARROW.

For the Executive :

EDWIN O. SACHS (*Chairman*).

Published by the Committee
as directed by the Executive.
H. S. TAYLOR,
(*Assist. Secretary.*)

Date—May 1st, 1900.

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Edited by Edwin O. Sachs.

FIRE TESTS WITH FLOORS.

A FLOOR
BY
THE MURAL AND DECORATIONS SYNDICATE, Ltd.,
LONDON.

The Committee's Report.

LONDON, 1900.

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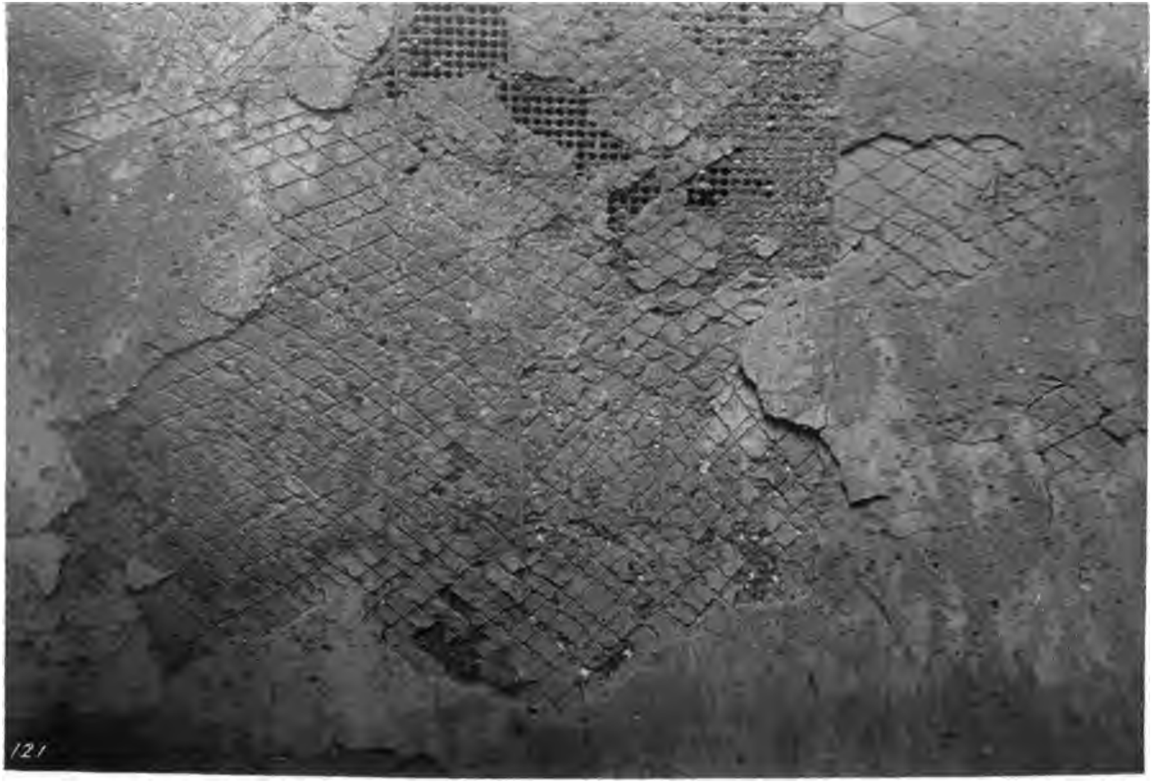

Fig. 8. VIEW SHOWING CONDITION OF CEILING AFTER FIRST TEST.

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OBJECTS OF THE COMMITTEE:

The main objects of the Committee are:—

To direct attention to the urgent need for increased protection of life and property from fire by the adoption of preventive measures.

To use its influence in every direction towards minimising the possibilities and dangers of fire.

To bring together those scientifically interested in the subject of Fire Prevention.

To arrange periodical meetings for the discussion of practical questions bearing on the same.

To establish a reading-room, library and collections for purposes of research, and for supplying recent and authentic information on the subject of Fire Prevention.

To publish from time to time papers specially prepared for the Committee, together with records, extracts, and translations.

To undertake such independent investigations and tests of materials, methods and appliances as may be considered advisable.

The Committee's Reports on Tests with Materials, Methods of Construction, or Appliances are intended solely to state bare facts and occurrences, with tables, diagrams, or illustrations, and they are on no account to be read as expressions of opinion, criticisms, or comparisons.

NOTE.

This Report of the Committee deals with the comparative results of a fire test applied to (*a*) an ordinary wood and match-boarded partition painted in oil colour, and (*b*) a partition built up in every detail similar thereto, but that the timber and wood prior to delivery were subjected to a chemical treatment. Moreover, this partition was painted with what is termed "non-flammable" paint, and the muslin hangings used were said to be dipped in a "non-flammable" solution.

F. HAMMOND.

LONDON,
June 30*th*, 1900.

THE GENERAL ARRANGEMENTS FOR TESTS.

(*MEMORANDUM.*)

The purpose of the tests undertaken by the British Fire Prevention Committee is to obtain reliable data as to the exact fire-resistance of the various materials, systems of construction, or appliances used in building practice.

The tests are of an entirely independent character, arranged on scientific lines, but with full consideration for the practical purpose in view. Absolute reliability is assured, records being mostly taken automatically or by photography, and the temperatures being easily regulated by the application of gas.

All reports on tests solely state the bare facts and occurrences, with tables, diagrams and illustrations, and on no account are reports to include expressions of opinion, nor should any expression be read as a comparison or criticism.

The general arrangement and direction of the tests are in the hands of the Executive, who act in accordance with certain principles laid down after careful study and experiment. The official tests are attended by the members of the Council and the members of the Committee in rotation.

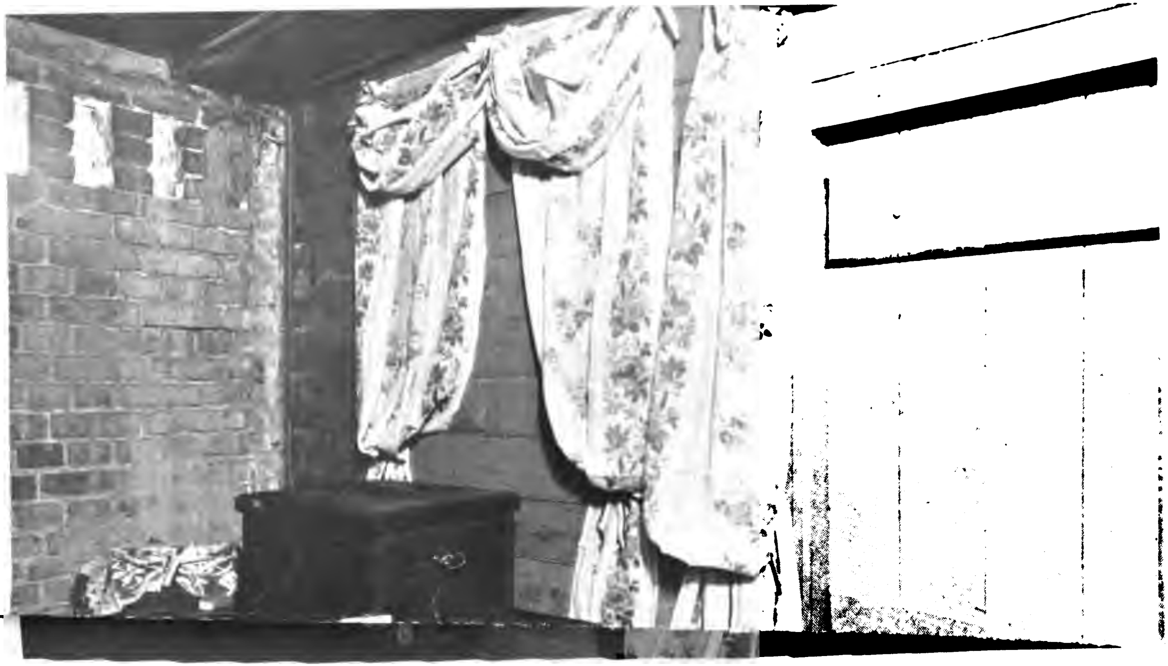
As to the Testing Station, it comprises two houses standing in their own grounds near Regent's Park, and backing on to the Regent's Canal. The principal building is used for Committee Rooms and laboratory purposes, whilst the gardens are utilised for so-called "full-size" tests.

As to the financial aspect of the station, the establishment expenses are being met by a special subscription. As far as the funds of the Committee permit, investigations and experimental tests with ordinary (*i.e.*, not patented) forms of construction are undertaken from time to time and duly reported on. *Official* tests with patented materials, makers' systems, etc., etc., are subject to a scale of charges. The Testing Station is also open to members for such private research work or tests they may desire to undertake.

The services of the members participating in the management of the station, conducting or attending tests, are given entirely gratuitously.

For the Executive,

EDWIN O. SACHS, *Chairman.*



VIEW AFTER TEST.

“NON-FLAMMABLE WOOD” PARTITION [illegible] VIEWS BEFORE AND AFTER TEST (FROM INSIDE).

OFFICIAL REPORTS
OF THE
British Fire Prevention Committee.
[FOUNDED 1897.--INCORPORATED 1899.]

FIRE TESTS No. 23 & 24.—MAY 2, 1900.

(No. 23) A MATCH-BOARDED PARTITION OF DEAL PAINTED WITH OIL COLOUR.

(No. 24) A MATCH-BOARDED PARTITION OF "NON-FLAMMABLE" DEAL PAINTED WITH "NON-FLAMMABLE" PAINT.

BY THE
LONDON NON-FLAMMABLE WOOD CO., LTD.,
LONDON.

OBJECT OF TEST.

To record the effect of a fire upon *non-flammable* wood and *ordinary* wood respectively, when used for match-boarded partitions, and to particularly ascertain the difference, if any, as to the *spread of flame* in the wood when in contact with fire.

Note.—The application of flame to be from one side and one point at a temperature increasing to about 1000° Fahr., for a period of 45 minutes.

The partitions to be constructed of studs with match boarding each side and to have doors in them.

The partitions of *non-flammable* and *ordinary* wood to be respectively painted with one coat of *non-flammable* and one coat of *ordinary paint.*

On the side of the partitions opposite the fire-side, a floor, some furniture and hangings to be provided, and these adjuncts to be similarly *non-flammable* and *ordinary* respectively.

The test with both partitions to be conducted simultaneously and the conditions to be similar in every respect.

Memo.—The only difference observable in the two chambers was in the width of the boards. In No. 1 hut they were 7 in. wide; in No. 2 hut, 6½ in. wide.

SUMMARY OF EFFECT.

ORDINARY WOOD PARTITION.

In 2 minutes the boarding of ceiling in passage and partition had caught fire.

In 3 minutes smoke appeared in the interior of chamber.

In 10 minutes portions of the ceiling in passage fell in flakes.

In 15 minutes sparks appeared in the chamber over top of door.

In 16 minutes flame over top of door, which caught muslin hangings.

In 18 minutes tablecloth caught alight. Pyrometer recorded temperature to the interior of the chamber at 103 degrees and 160 degrees respectively.

In 19 minutes the boarding of ceiling in passage burnt through and falling in lengths.

In 20 minutes top board to partition next passage was burnt through.

In 22 minutes top part of door was mostly consumed.

In 26 minutes top of door inside the chamber was blazing freely.

In 30 minutes fire all along the top of the partition.

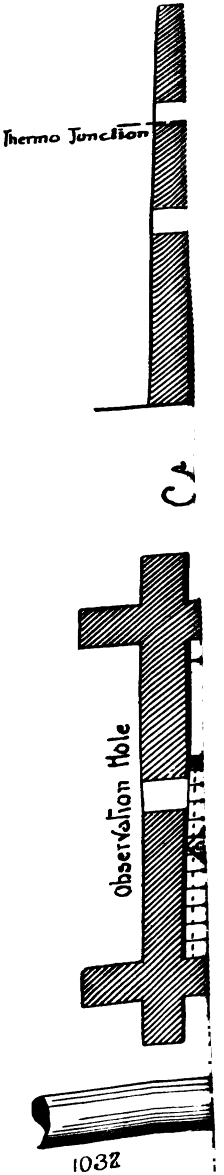
In 31½ minutes chair hangings caught alight, and the whole of the furniture began to burn.

In 32 minutes the interior of the chamber was well alight, everything blazing freely, the whole chamber being full of flame.

In 45 miuutes everything was consumed except the studs, which were blazing freely.

NON-FLAMMABLE WOOD PARTITION.

In 6 minutes signs of charring on boarding of ceiling over gas flame.



These figures

In 17 minutes charred wood fell ½ in. thick from boarding of ceiling in passage.

In 20 minutes the chamber was full of smoke with offensive smell.

In 22 minutes large quantity of ceiling boarding in passage falling and beams of hut exposed to view.

In 27 minutes smoke inside chamber more intense, and large quantities issuing from draught holes.

In 29 minutes two lower boards of partition buckled near the gas flame.

In 39 minutes inside of chamber clearer, but objects therein hidden by smoke except table close to the observation hole.

In 40 minutes charred pieces falling from partition in passage.

In 45 minutes wood flaming in third board from bottom over third stud from East wall in passage.

At the close of the test the chamber was entered and the furniture, curtain, and antimacassars were intact and unaffected, except at the East end, where scorched by the burning of timber roof of hut.

The pyrometers recorded no temperatures to the interior of the chamber, inasmuch as at no time during the test did the temperature exceed 100° Fahr.

DESCRIPTION OF TESTING PLANT.

(*See Figs.* 1, 2, 3 *and* 4.)

The two huts used were located at the Committee's Testing Station, and were known as "Huts Nos. 1 and 2."

The huts were constructed, as shown, of stock bricks, with lime mortar, and each measured 10 ft. by 10 ft., internally.

The roof of each of the huts was 7 ft. 10 in. above the pavement, and was constructed of balk timber (not treated).

The door-openings were on the south side and measured 2 ft. 3 in. by 6 ft. 6 in.

The fuel used was gas produced at the station, and the supply was regulated by valves and dampers.

The flame in each case was obtained by the admission of gas through a bunsen burner, the internal diameter of the burner being 4 in. There was one such burner in each hut.

A Roberts-Austen pyrometer was used for recording temperatures, 10 observation points in all being used, viz.: points No 5 and No. 10 being in the flame, No. 1 and No. 6 being in the side walls near the soffit of the hut over the flame, No. 4 and No. 9 being near the soffit at the west side of the passage, and No. 2, 3, 7 and 8 being near the soffit inside the chambers.

There were observation holes in the east and west walls of each hut, covered by moveable sheet-iron shutters.

The draught holes were in the east and west walls.

CONSTRUCTION OF THE ORDINARY WOOD PARTITION IN HUT No. 1.

(See Fig. 5.)

The timber used in No. 1 Hut was stated to be DDD 1 in. by 7 in. yellow flooring, DDD 1 in. by 7 in. yellow flooring T G and B, and DDD 3 in. by 2 in. yellow T G and B. It was delivered at the Testing Station on April 23rd.

From April 24th to 26th the partition was erected.

The partition was constructed with 2 in. by 3 in. studs, 2 in. by 3 in. head, 2 in. by 3 in. sill, and 4 in. by 3 in. wrought doorposts and head with ¾ in. rebate.

The studs were nailed to the head and sill.

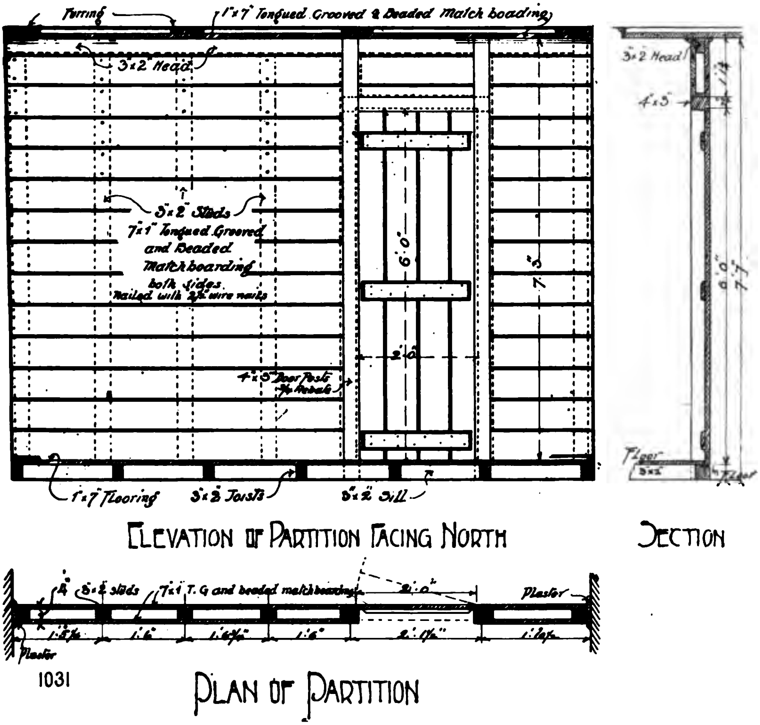
The studs against the walls were nailed with 5 in. wire nails.

The studs were covered with 1 in. by 7 in. beaded match-boarding nailed with 2½ in. wire nails.

The door was of one thickness, 1 in. by 7 in. beaded match-boarding, with three 1 in. by 6½ in. battens on the inside, nailed with 2½ in. wire nails and clinched.

The doors were hung on two 16 in. wrought iron cross garnett hinges, each hinge secured with five 1½ in. screws and two 2½ in. by ¼ in. bolts.

The door was fastened with two 6 in. barrel bolts. 1⅛ in. moulding as angle bead was fixed all round the partition.


Furring
1"×7" Tongued Grooved & Beaded Match boading
3"×2" Head
3"×2" Studs
7"×1" Tongued Grooved and Beaded Matchboarding both sides. Nailed with 2½" wire nails
6'0"
7'3"
2'0"
4"×5" Door Posts ¾ Rebate
1"×7" Flooring
3"×2" Joists
3"×2" Sill
ELEVATION OF PARTITION FACING NORTH
3"×2" Head
4"×5"
1'1¾"
6'0"
7'7"
Floor
3×2
Floor
SECTION
4"
3"×2" studs
7"×1" T. G and beaded matchboarding
2'0"
Plaster
1'5½"
1'6"
1'6¾"
1'6"
2'1½"
1'10½"
Plaster
1031
PLAN OF PARTITION

Arrangement of Partitions in Huts No. 1 and No 2. *Fig.* 5.

On April 27th all the woodwork was painted one coat with oil and lead paint.

A coke fire was lighted in the hut on May 1st at 1 o'clock and kept in until 3 o'clock the same day.

Note.—The ceiling of passage outside the partition and inside the chamber for a distance of 1 ft. 2 in. was firred down 1 in. from the timber ceiling of the hut, the firring strips running north and south, the ceiling under test being 5 ft. wide measured from the south wall and 10 ft. long, and was made with 1 in. by 7 in. beaded matchboarding, nailed with 3 in. and 5 in. wire nails.

A floor in the chamber was made with 2 in. by 3 in. joists laid on the floor of the hut and covered with 1 in. by 7 in. flooring nailed with 2½ in. wire nails.

Inside the Testing Chamber were placed a yellow deal table, two chairs and a small chest, and all were stained with one coat of ordinary stain.

Muslin curtains were hung over the door and along the partition.

Antimacassars were placed over the backs of chairs and a cloth on the table.

Note.—A tarpaulin was kept over the hut continuously until the morning of the test, when it was removed.

CONSTRUCTION OF THE NON-FLAMMABLE WOOD PARTITION IN HUT No. 2.

The wood, studs and boarding which had (as stated by the Non-Flammable Wood Company) been treated by their process at the London Non-Flammable Wood Co.'s Works at Fulham, were delivered at the Testing Station on April 26th and erected on that and the following day, the 27th. The wood had been painted with one coat of what was described as "non-flammable" paint before delivery.

The material used was stated by the Company to be of the following description:—

BSS.C.,	1 in. by 6½ in.	yellow T. G. and B.,	treated August, 1899.
DDD.,	1 in. by 7 in.	yellow flooring,	treated May, 1899.
DDD.,	3 in. by 2 in.	yellow ,,	treated July, 1899.

The partition was constructed with 2 in. by 3 in. studs, 2 in. by 3 in. head, 2 in. by 3 in. sill, and 4 in. by 3 in. wrought doorposts and head with ¾ in. rebate.

The studs were nailed to the head and sill.

The studs against the walls were nailed with 5 in. wire nails.

The studs were covered with 1 in. by 6½ in. beaded matchboarding nailed with 2½ in. wire nails.

The door was of one thickness, 1 in. by 7 in., beaded matchboarding with three 1 in. by 6½ in. battens on the inside, nailed with 2½ in. wire nails and clinched.

The doors were hung on two 18 in. wrought iron cross garnett hinges, each hinge secured with five 1½ in. screws and two 2½ in. by ¼ in. bolts.

The door was fastened with two 6 in. barrel bolts; 1⅛ in. moulding as angle bead was fixed all round the partition.

On April 30th a coke fire was lighted in the hut at 3 o'clock, and kept in until 7 o'clock.

NOTE.—The ceiling of passage outside the partition and inside the chamber for a distance of 1 ft. 2 in. was firred down 1 in. from the permanent timber ceiling of the hut, the firring strips running north and south, the ceiling under test being 5 ft. wide measured from the south wall, and 10 ft. long, and was made with 1 in. by 7 in. beaded matchboarding, nailed with 3 in. and 5 in. wire nails.

A floor in the chamber was made with 2 in. by 3 in. joists laid on the floor of the hut, and covered with 1 in. by 7-in. flooring, nailed with 2½ in. wire nails.

Inside the Testing Chamber were placed a table, 2 chairs and a small chest, all of which were stated to be of yellow deal, and to have been treated with a non-flammable solution, and stained one coat of green stain.

Muslin curtains were hung over the door and along the partition. Antimacassars were placed over the backs of chairs and a cloth on the table.

All these articles were stated by the Non-Flammable Wood Co. to have been treated with a non-flammable solution.

Note.—A tarpaulin was kept over the hut continuously until the morning of the test, when it was removed.

RECORD OF TEMPERATURE (POINTS NOS. 1 TO 10).

TIME.	ORDINARY WOOD PARTITION.					NON-FLAMMABLE WOOD PARTITION.				
	ON FIRE SIDE (IN PASSAGE).			INSIDE THE CHAMBER.		ON FIRE SIDE (IN PASSAGE).			INSIDE THE CHAMBER	
	No. 5 (Flame).	No. 1.	No. 4.	No. 2.	No. 3.	Nc. 10 (Flame).	No. 6.	No. 9.	No. 7.	No. 8.
	Fahr.	Fahr.	Fahr.	Fahr.	Fahr.	Fahr.	Fahr.	Fahr.	Fahr.	Fahr.
3.10	850°	150°	...	...	...	850°	200°	—	—	—
3.13	1120°	1100°	450°	...	...	1340°	750°	110°	—	—
3.16	1200°	960°	500°	...	...	1400°	1100°	300°	—	—
3.19	1310°	1230°	750°	...	...	1405°	950°	350°	—	—
3.22	1300°	1060°	750°	..	...	1425°	850°	395°	—	—
3.25	1500°	1250°	600°	...	...	1230°	730°	360°	—	—
3.28	1400°	1300°	1000°	105°	160°	1420°	800°	400°	—	—
3.31	1300°	1230°	1100°	100°	165°	1500°	1100°	400°	—	—
3.34	1550°	1300°	1100°	150°	200°	1320°	1000°	400°	—	—
3.37	1600°	1700°	1300°	330°	450°	1350°	1050°	450°	—	—
3.40	1575°	1800°	1250°	450°	670°	1400°	1100°	400°	—	—
3.43	1500°	1750°	1360°	1100°	1200°	1450°	1200°	410°	—	—
3.46	1500°	1750°	1550°	1250°	1350°	1380°	1100°	300°	—	—
3.49	1560°	1800°	1680°	1700°	1540°	1520°	1170°	310°	—	—
3.52	1500°	1710°	1740°	1560°	1500°	1545°	1280°	430°	—	—
3.55	1300°	1500°	1730°	1400°	1390°	650°	900°	400°	—	—

THE TEST.

On Wednesday, May 2nd, 1900, the test was undertaken. The following is a log of the test:—

At 3 p.m. the meteorological observations, taken at the Royal Botanic Gardens, Regent's Park, read as follows:—"State of weather, cloudy; wind, S.W.; barometer, 29·95; attached thermometer, 61·5° Fahr.; dry bulb, 65° Fahr.; wet bulb, 52·5° Fahr. Remarks: Very fine afternoon."

At 3 p.m. the partitions were intact.

Ordinary Wood Partition.	Non-Flammable Wood Partition.
Hut No. 1.	Hut No. 2.
Outside.	*Outside.*
At 3.10 p.m. the gas was lighted.	At 3.10 p.m. the gas was lighted.
At 3.12 p.m. the ceiling in passage caught alight, and the boarding to partition on passage side, east corner.	
	At 3.16 p.m. signs of charring on ceiling boarding of passage over gas flame; also on 6th and 11th boards from bottom, the surface also turning white.
At 3.20 p.m. portions of ceiling in passage falling in flakes.	
	At 3.27 p.m. charred wood falling, ½ in. thick, from the ceiling boarding.

ORDINARY WOOD PARTITION, OUTSIDE (*continued*).	NON-FLAMMABLE WOOD PARTITION, OUTSIDE (*continued*).
At 3.29 p.m. the boarding to ceiling in passage burned through and falling in lengths.	
At 3.30 p.m. the top board to partition on passage side burned through.	At 3.30. p.m. charred moulding falling off the 15th board from bottom.
At 3.32 p.m. the top part of door above top ledge mostly consumed, and flame drawing in over same.	At 3.32 p.m. large quantity of ceiling boarding falling and beams exposed to view.
	At 3.39 p.m. two lower boards of partition buckled near the gas flame, as if they were twisting away from studs.
	At 3.40 p.m. area of about 2 ft. by 2 ft. of the roof timbers of hut over gas flame incandescent.
At 3.42 p.m. the boarding to partition on passage side falling down.	
At 3.50 p.m. photograph of burning chamber taken.	At 3.50 p.m. charred pieces were falling; also pieces from the 14th and 13th boards, and the 14th was buckling.
	At 3.53 p.m. about 9 in. by 7 in. off 14th board, and the board was buckling badly next east wall.

Ordinary Wood Partition, Outside (*continued*).

At 3.55 p.m. everything consumed, with the exception of the studs to partition, which were blazing freely, and the remains of some boarding to west of doorway.

At 3.58 p.m. water applied to extinguish remains and test concluded.

Inside.

At 3.13 p.m. smoke appeared in the interior of chamber.

At 3.25 p.m. sparks coming into chamber over top of door.

At 3.26 p.m. flame over top of door, which caught the hangings that were hung over and down the door on either side.

At 3.27 p.m. hangings over table caught alight and burned away.

At 3.28 p.m. tablecloth caught alight.

Non-Flammable Wood Partition, Outside (*continued*).

At 3.55 p.m. flaming wood in 3rd board from bottom over third stud from east wall. Gas shut down, test concluded.

At 3.55 the inner chamber was entered.

Inside.

At 3.30 p.m. hut full of smoke with a very offensive smell.

ORDINARY WOOD PARTITION, INSIDE (*continued*).	NON-FLAMMABLE WOOD PARTITION, INSIDE (*continued*).
At 3.35 p.m. smoke coming through into chamber along bottom of door, and also on the east side between partition and wall. A portion of the boarding to partition, on the inside just over table, became ignited from the burning tablecloth. This subsequently went out before the interior became well alight.	
At 3.36 p.m. the top of the door on the inside blazing freely.	
At 3.37 p.m. the boarding forming the ceiling against the top of the partition began to burn.	At 3.37 p.m. smoke inside hut more intense, and large quantities issuing from draught holes.
At 3.40 p.m. fire all along the top of the partition.	
At 3.41 p.m. fire extending down door to the middle rail.	
At 3.41½ p.m. chair-hanging suddenly caught alight and almost immediately the whole of the furniture began to burn.	
At 3.42 p.m. the interior of the chamber well alight and everything blazing freely, the whole chamber being full of flame.	

Ordinary Wood Partition, Inside (*continued*).	Non-Flammable Wood Partition, Inside (*continued*).
	At 3.45 p.m. smoke very dense inside hut and large quantities still issuing from draught holes.
At 3.47 p.m. the door falling into the chamber.	
	At 3.49 p.m. inside of chamber clearer but objects therein hidden by smoke, except table close to the observation hole.

OBSERVATIONS ON CONCLUSION OF THE TEST.

Ordinary Wood Partition.	Non-Flammable Wood Partition.
	Outside.
	At 3.59 p.m. bright spot of flame in partition between the 12th and 13th boards, and flame on the 5th board, the flame being in the space between the boarding.
	The flame noted at 3.55 p.m. now extended three boards high; immediately after this pieces of the 2nd, 3rd, 4th and 5th boards fell.
	At 4.0 p m. spit of flame on 12th board disappeared.

NON-FLAMMABLE WOOD PARTITION, OUTSIDE (*continued*).

At 4.5 p.m. a small jet of flame, which had expired, reappeared on 3rd board.

At 4.5 p.m. 3rd board from bottom blazing in front of 3rd stud from the east wall, and the flame about 14 in. high.

At 4.6 p.m. roof of hut burning on passage side.

At 4.16 p.m. debris still flaming and burning on outside of partition next pavement.

At 5.0 p.m, flames dying down. Heap of debris on the floor in state of incandescence.

At 5.4 p.m. water applied to roof of hut.

At 5.6 p.m. heap of embers and slight flame still burning on pavement outside, about 12 in. east of the gas outlet.

At 5.15 p.m. shreds and pieces of the boarding curling up (off the face of the boarding) outwards, and burnt ends of boards curling outwards.

NON-FLAMMABLE WOOD PARTITION (*continued*).

Inside.

At 4.6 p.m. curtain and furniture inside the chamber intact.

At 4.8 p.m. furniture taken outside, the roof of hut being on fire.

At 4.22 p.m. bright spot of burning wood inside chamber and flame at floor about 2 ft. 6 in. from east wall.

At 4 40 p.m. flame now burnt through two places at floor level, one as last item and one nearer east wall (between 3 in. and 5 in. from wall).

At 4.45 p.m. lower part of partition still burning, in two places burnt through on to inside.

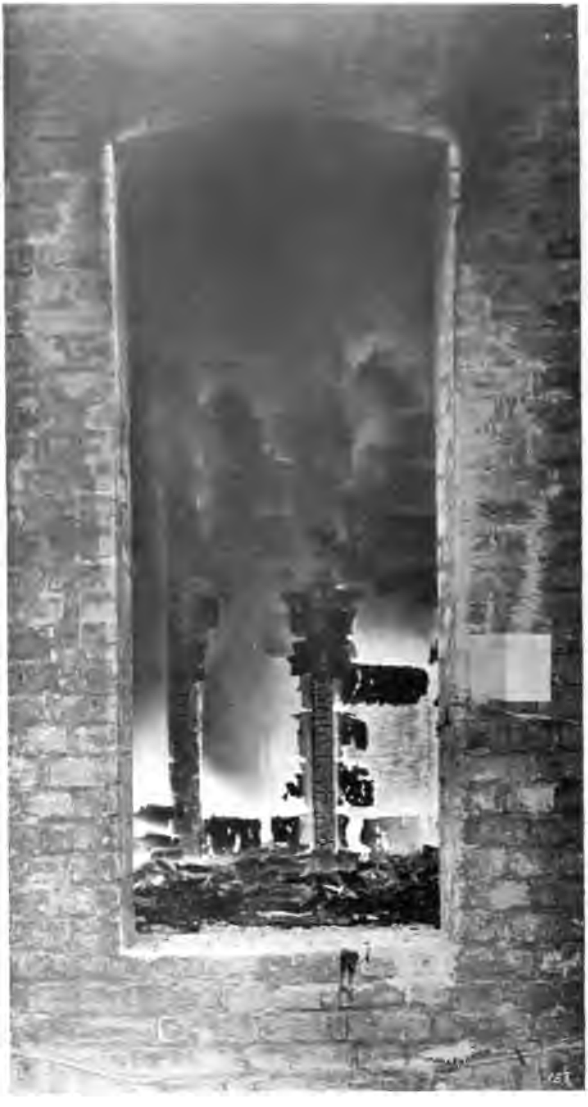
At 5.0 p.m. one flame went out on inside and one near the wall was dying out.

OBSERVATIONS AFTER THE TEST.

NON-FLAMMABLE WOOD PARTITION.

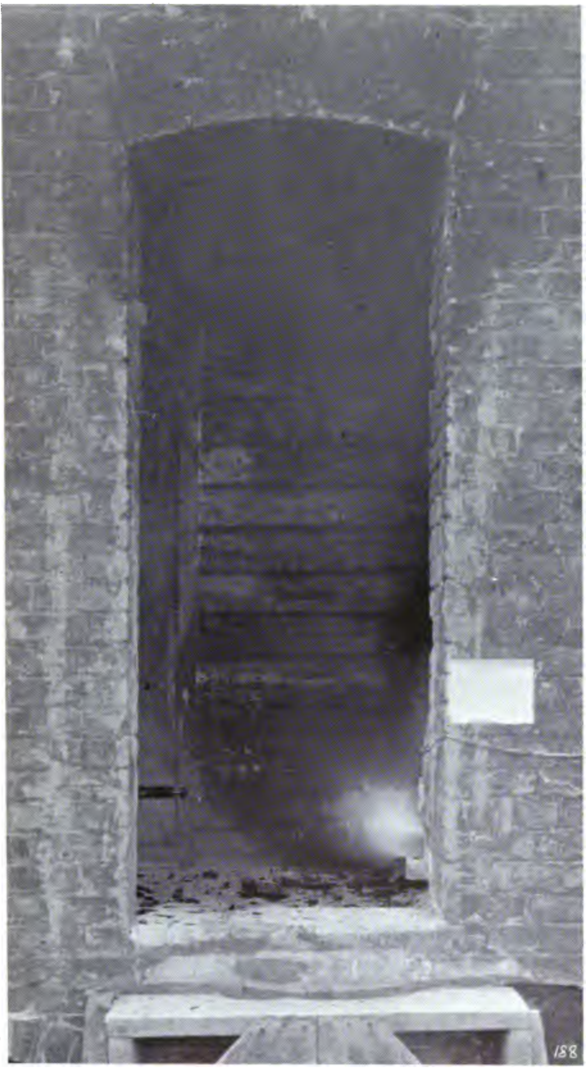
A survey was made of the hut on the 5th May, when the following points were observed :—

OUTSIDE.—Door scorched at top, otherwise perfectly sound and japan on bolts and hinges unaffected, boarding on the left-hand side scorched at top and lower part of boarding, east side of door, 6 in. up face charred and flaked, but otherwise sound. The depth of the charred



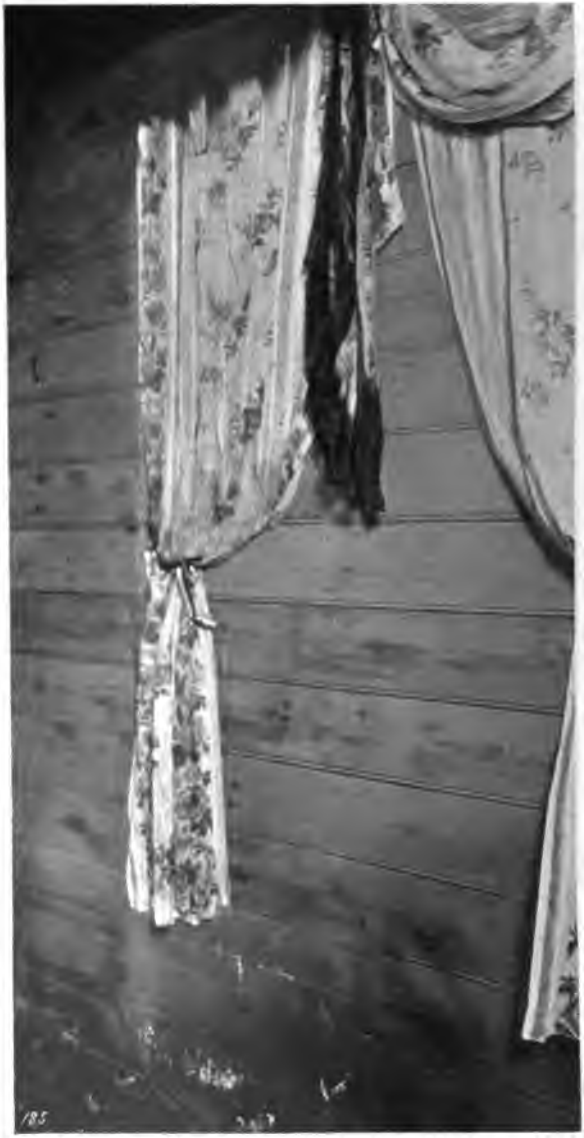
Ordinary Wood Partition.

Fig. 13. View during Test (after 40 minutes).



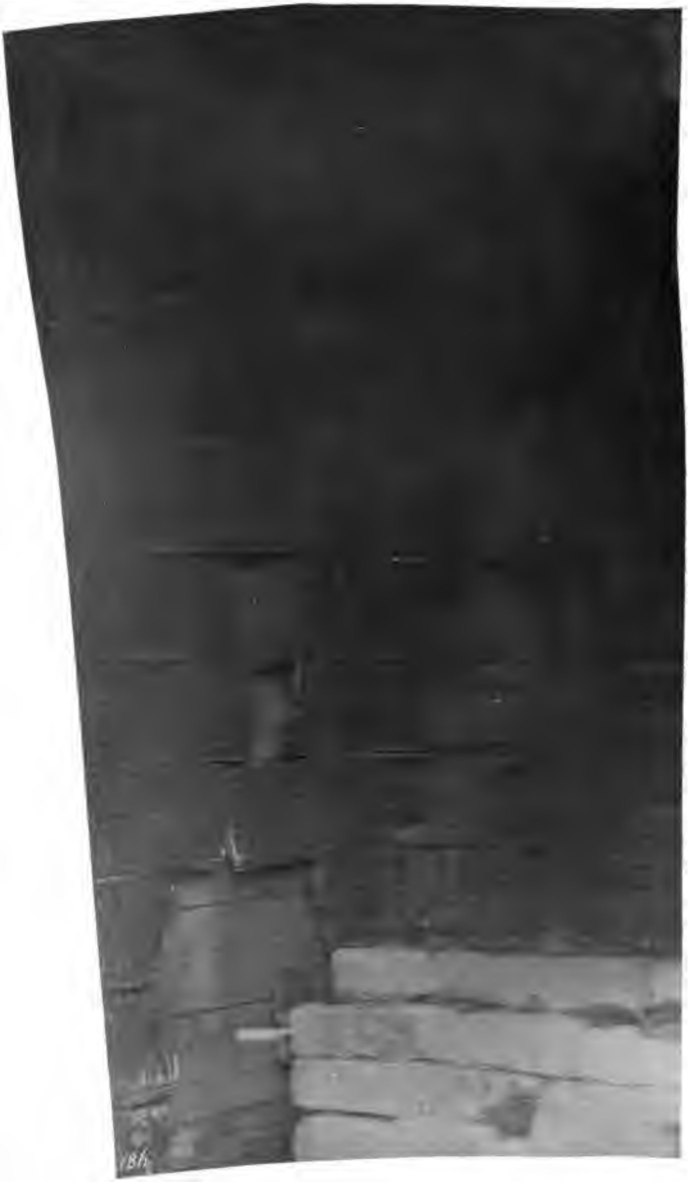
NON-FLAMMABLE WOOD PARTITION.

Fig. 12. VIEW DURING TEST (AFTER 40 MINUTES).



NON-FLAMMABLE WOOD PARTITION.

Fig. 14. VIEW ON CONCLUSION OF TEST (FROM INSIDE).



Non-Flammable Wood Partition.

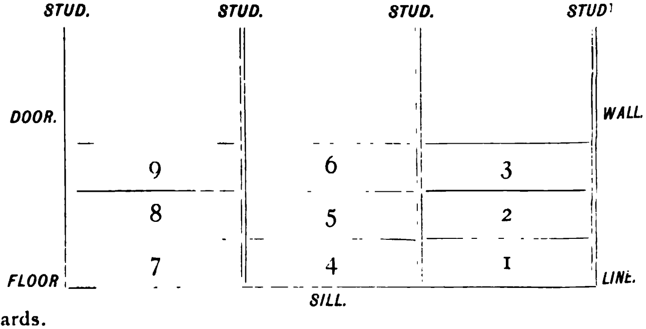
Fig. 15. View on conclusion of Test (from outside).

surface was as follows: 1st board ⅛ in., 2nd ¼ in., 3rd ¼ in., 4th ⅛ in. Paint on boards sound at the bottom to the east of doorway.

PARTITION directly against the gas aperture, 8 boards up, all gone between the studs, 9th about half gone, 10th quarter, 11th half, 12th charred but still in position, 13th ditto ditto, 14th and 15th about half gone. Between two east studs 4 boards gone; 5, 6, 7, 8, 9 and 10th boards in position, but charred; 11th partly gone, 12th in position but in two pieces; 13, 14 and 15 all gone.

STUDS.—East stud charred at bottom 2 ft. up; at top of same ditto, 1 ft. down; 2nd stud charred 2 ft. up; 11th board, one piece burnt nearly through around the nails, top of stud about 4 in. down charred. 3rd stud nearer flame, charred about 2 ft. 6 in. up, wood above perfectly sound, only discoloured. Top of this stud sound. Head between two east studs in position, but all charred; face of head in next bay slightly charred. Sill all charred between three studs.

Back of inside boarding as seen from passage.



Boards.		
1	Charred,	all gone.
2	„	nearly gone.
3	„	⅛ in.
4	„	all through.
5	„	„
6	„	⅛ in.
7	„	½ in. and burnt through near the stud.
8	„	¼ in.
9	„	½ in.

About one-third of the boarding to ceiling in passage gone, the rest black and charred by the roof of hut burning away.

Inside the Chamber. Flooring intact and unaffected. Curtains and furniture intact and unaffected, except at the east end, where scorched through the burning of timber forming roof of hut. Boarded ceiling inside the chamber charred away next the east end, also by the burning of the roof of the hut.

GENERAL ARRANGEMENTS.

The test was carried out according to the procedure laid down by the Executive for investigations of this description, and conducted by a Sub-Committee of the Executive, comprising:—

Mr. F. Hammond, F.R.I.B.A., District Surveyor, East Hampstead. (Directing Member.)
Mr. Max Clarke, A.R.I.B.A.
Mr. Ellis Marsland, District Surveyor, Camberwell.
Mr. Matt Garbutt, A.M.I.C E , A.R.I.B.A., Surveyor, Metropolitan Railway.

Mr. Thomas Kissack, Resident Engineer at the Testing Station, assisted the Sub-Committee.

Mr. H. B. White, M.I.E.E., superintended in the Instrument Room.

The Council was represented by:
Mr. H. Gundry, F.R.I.B.A., District Surveyor, Paddington.

The Executive was represented by:
Mr. Edwin O. Sachs (Chairman).
Mr. Charles E. Goad, M.Am.Soc.C.E., M.Can.Soc. C.E.

The Commercial Section was represented by:
Mr. Frederic R. Farrow, F.R.I.B.A.

The Members' Testing Sub-Committee was represented by:

Mr. George E. Monckton, M.A.

The general body of Members was represented by:

Mr. S. Flint Clarkson, F.R.I.B.A., District Surveyor, Chelsea.

Mr. C. H. Cooper, A.M.Inst.C.E., Surveyor to Urban District Council, Wimbledon.

Mr. Arthur Crow, F.R.I.B.A., District Surveyor, Whitechapel.

Mr. F. W. Hamilton, A.R.I.B.A., District Surveyor, North Fulham.

Mr. E. R. Hewitt, A.R.I.B.A., District Surveyor, St. Saviour's, Southwark, and North Lambeth.

Mr. H. W. Tinne, J.P., Tunbridge Wells.

The London Non-Flammable Wood Company, Ltd., was represented by:

Admiral Sir Henry Nicholson, K.C.B.; Lieut-Col. James Colquhoun; Mr. S. E. Evershed; Mr. Arthur J. Greenop; Captain Laborde, R.N.; Captain G. McArthur, R.N.; Captain G. C. Sconce; Mr. Oscar Merrick.

The following visitors attended by special invitation of the Executive:—

Baron von Horst; General Stuart Nicholson, C.B., Commander George Hodgkinson, R.N. (British India Steam Navigation Company); Mr. G. K. Trench, Assistant Engineer, Trinity House; Mr. J. Goodchild, District Surveyor, East Islington; Mr. George H. Bibby, F.R.I.B.A. (Architects' Department, L.C.C.); Mr. R. Robertson (Architects' Department, L.C.C.); Mr. W. J. Heaton; Mr. G. H. Greaves; Mr. J. Armstrong; Mr. Howard Brunlees; Mr. Stephen Earl; Mr. Goodchild, Junr.; Mr. E. Greenop; Mr. J. Grimble Groves; Mr. A. Harley; Mr. James Johnstone; Mr. J. C. Kay; Surgeon-Major McSheehy; Mr. W. Nicholl; Mr. Norris; Mr.

T. F. Reeve; Mr. Norman A. Reid; Mr. James Ritchie; Captain Russell; Mr. W. Sanderson; Mr. Schafer; Mr. H. K. Sconce; Mr. H. Turner; Mr. Chas. Vertue.

For the Sub-Committee conducting the test:

F. HAMMOND (*Directing Member*).

For the Executive and for the Commercial Section:

FRED. R. FARROW.

Published by the Committee as directed by the Executive.

H. S. TAYLOR

(*Assistant Secretary*).

26th June, 1900.

Verified a true copy of the Report, ordered to be published.

WILLIAMSON, HILL & Co.

(*Solicitors*).

28th June, 1900.

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PUBLICATIONS OF THE
BRITISH FIRE PREVENTION COMMITTEE.—No. 58.
Edited by Edwin O. Sachs.

IRE TESTS WITH PARTITIONS

A SUSPENDED PARTITION

BY

THE FIREPROOF PARTITION SYNDICATE, LTD.
LONDON

The Committee's Report

LONDON, 1901

PUBLISHED AT THE OFFICES OF
THE BRITISH FIRE PREVENTION COMMITTEE
(Founded 1897—Incorporated 1899)
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21. FIRE TESTS WITH FLOORS. A Floor of Steel Joists, filled in with Concrete on Corrugated Iron, with a Suspended Ceiling.
22. FIRE TESTS WITH PARTITIONS. A Lath and Plaster Partition; a Bricked Nogged Partition.
23. FIRE TESTS WITH FLOORS. A Floor by the Columbian Fireproofing Co., New York.
24. FIRE TESTS WITH DOORS. A 2-in. Solid framed Teak Door; a 1-in. Four-panel Pine Door; a 1-in. Four-panel Pine Door.
25. FIRE TESTS WITH DOORS. A Wood Door covered with Tinned Steel Plates; an Iron Framed and Panelled Door.
26. FIRE TESTS WITH DOORS. A 2-in. Framed Oak Door, with 2-in. Solid Panels; a 2-in. Framed Teak Door, with 2-in. Solid Panels.
27. FIRE TESTS WITH PARTITIONS. A Match-boarded Partition filled in with Silicate Cotton (Slag Wool) by Messrs. T. Anderson & Son, and Messrs. T. Broadbent & Co.
28. FIRE TESTS WITH CEILINGS. A Ceiling of Silicate Cotton (Slag Wool) by Messrs. T. Anderson & Son, and Messrs. T. Broadbent & Co.
29. FIRE TESTS WITH GLASS. Three Casements glazed by the British Luxfer Prism Syndicate, Ltd.
30. FIRE TESTS WITH GLASS. Five Skylights glazed by the British Luxfer Prism Syndicate, Ltd.
31. FIRE TESTS WITH GLASS. Three Casements glazed with Wired Glass by Messrs. Pilkington, Bros.
32. FIRE TESTS WITH GLASS. Two Skylights glazed with Wired Glass by Messrs. Pilkington, Bros.
33. FIRE TESTS WITH GLASS. A Casement glazed with ¼-in. Plate Glass, a Casement glazed with 32 oz. Sheet Glass; a Casement glazed with "Lead Lights."
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37. FIRE TESTS WITH PARTITIONS. A Partition erected by the "Gypsine" Brick Company, Ltd., London and Paris.
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46. FIRE TESTS WITH FIRE-RESISTING CURTAINS. Two "Screen-Sail" Curtains by Mr. Rasmus Bugge.
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OBJECTS OF THE COMMITTEE.

The main objects of the Committee are:—

To direct attention to the urgent need for increased protection of life and property from fire by the adoption of preventive measures.

To use its influence in every direction towards minimising the possibilities and dangers of fire.

To bring together those scientifically interested in the subject of Fire Prevention.

To arrange periodical meetings for the discussion of practical questions bearing on the same.

To establish a reading-room, library and collections for purposes of research, and for supplying recent and authentic information on the subject of Fire Prevention.

To publish from time to time papers specially prepared for the Committee, together with records, extracts and translations.

To undertake such independent investigations and tests of materials, methods and appliances as may be considered advisable.

The Committee's Reports on Tests with Materials, Methods of Construction, or Appliances are intended solely to state bare facts and occurrences, with tables, diagrams, or illustrations, and they are on no account intended to read as expressions of opinion, criticisms, or comparisons.

NOTE.

The series of door tests undertaken by the Committee would not be complete if some record were not obtained regarding the resistance afforded by the more ordinary forms of doors in every-day use.

In an earlier publication (No. 24) some such records were already presented, but the doors under investigation were smaller than those that have lately been before the Committee, and the circumstances under which these tests were undertaken were very different.

So as to make the series of reports as complete as possible, and so as to afford every facility for true comparison, some further tests with a four-panel door and a ledged door, both of yellow deal, were arranged for during the past summer.

I trust that the results embodied in this publication will be found useful.

EDWIN O. SACHS.

LONDON,
December 15*th*, 1900.

THE GENERAL ARRANGEMENTS FOR TESTS.

(*MEMORANDUM.*)

The purpose of the tests undertaken by the British Fire Prevention Committee is to obtain reliable data as to the exact fire-resistance of the various materials, systems of construction, or appliances used in building practice.

The tests are of an entirely independent character, arranged on scientific lines, but with full consideration for the practical purpose in view. Absolute reliability is assured, records being mostly taken automatically or by photography, and the temperatures being easily regulated by the application of gas.

All reports on tests solely state the bare facts and occurrences, with tables, diagrams and illustrations, and on no account are reports to include expressions of opinion, nor should any expression be read as a comparison or criticism.

The general arrangement and direction of the tests are in the hands of the Executive, who act in accordance with certain principles laid down after careful study and experiment. The official tests are attended by the members of the Council and the members of the Committee in rotation.

As to the Testing Station, it comprises two houses standing in their own grounds near Regent's Park, and backing on to the Regent's Canal. The principal building is used for Committee Rooms and laboratory purposes, whilst the gardens are utilised for so-called "full-size" tests.

As to the financial aspect of the station, the establishment expenses are being met by a special subscription. As far as the funds of the Committee permit, investigations and experimental tests with ordinary (*i.e.*, not patented) forms of construction are undertaken from time to time and duly reported on. Official tests with patented materials, makers' systems, etc., etc., are subject to a scale of charges. The Testing Station is also open to members for such private research work or tests they may desire to undertake.

The services of the members participating in the management of the station, conducting or attending tests, are given entirely gratuitously.

For the Executive,

EDWIN O. SACHS, *Chairman.*

EXPERIMENTAL FIRE TESTS

CONDUCTED BY THE EXECUTIVE

OF THE

British Fire Prevention Committee.

[FOUNDED 1897.—INCORPORATED 1899.]

FIRE TESTS IA AND JA, JULY 11TH, 1900.

Ia.—A Deal Ledged Door with 1-in. Boarding.

Ja.—A 2-in. Deal Four-panel moulded both sides Door.

OBJECT OF TEST.

To record the effect of a fierce fire of one hour, gradually increasing to a temperature of 2,000° Fahr.

Note.—The fire was to be applied from one side, and the doors were to open inwards on to the fire side.

Note.—The door-openings were to be approximately 3 ft. 3 in. by 6 ft. 9 in.

SUMMARY OF EFFECT.

DEAL LEDGED DOOR.

In 4 minutes flame appeared over top of door.
In 8 minutes flame had extended all along top.
In 21 minutes the upper half of door was fully alight.
In 25 minutes the test was closed, as the door was practically destroyed.

DEAL FOUR-PANEL MOULDED BOTH SIDES DOOR.

In 15 minutes flame appeared over top rail of door.

In 16 minutes flame came through top panel.

In 21 minutes flame came through lower panels.

In 25 minutes the test was closed, as the door was practically destroyed.

DESCRIPTION OF TESTING PLANT.

(See Figs. A, B, C *and* D).

The Testing Chamber used was located at the Committee's Testing Station, and was known as No. 6 Hut.

The hut was constructed, as shown, of stock bricks with lime mortar, and measured 10 ft. by 10 ft. internally. The ceiling of the hut was 9 ft. 6 in. above the pavement of the chamber, and was formed of solid wood beams grouted with fire-clay.

The fuel used was gas produced at the station, and the supply was regulated by valves and dampers.

The gas was admitted through two mixing chambers of fire-brick, as shown.

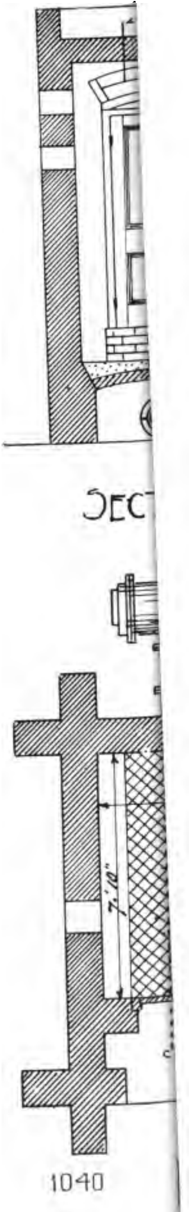
Two Roberts-Austen pyrometers were used for recording temperatures, to take four observation records from points Nos. 1, 2, 3, 4, and one automatic record from point No. 5. Points Nos. 2 and 3 were outside the doors, and the others on the fire side of doors. *(See roof plan.)*

There were observation holes in the east and west walls, closed by movable iron shutters.

The draught holes were in the east and west walls.

The photographs were taken by daylight.

A brick wall, 14 in. thick, with two openings 3 ft. 3 in. wide, 7 ft. high, was built across the hut, running from east to west. It was built 13 in. back from the main



ASTOR, LENOX AND
TILDEN FOUNDATIONS.

wall. The wall was carried up to the ceiling, the height between floor and ceiling being 9 ft. 6 in. The two openings were arched over with brick arches in two half-brick rings. The wall was built with gauged stuff.

CONSTRUCTION OF THE DOORS.

DEAL LEDGED DOOR.

(See Figs. E *to* G*).*

The door was constructed, as shown in Figs. E and F, of wrought yellow deal. The vertical boards were tongued, groved and beaded, and were 6 in. wide and 1 in. thick.

The ledges were 6 in. by 1 in., chamfered on edges.

The ledges and boards were screwed together with 1½ in. screws.

The frame was of yellow deal 4½ in. by 3½ in. with a rebate for door ⅝ in. deep.

The sill was of oak, 4½ in. by 3½ in.

The door was hung with one pair of 20-in. cross garnetts, and fastened with a rim lock.

Neither the door or frame were painted.

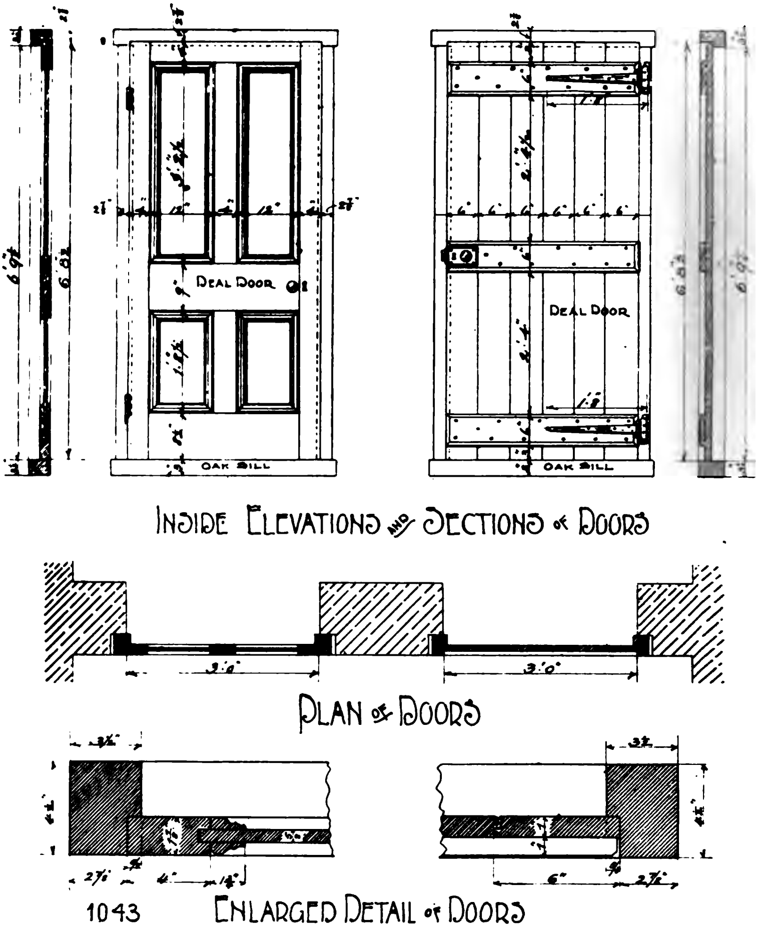
THE DEAL FOUR-PANEL DOOR.

The door was constructed, as shown in Figs. E and F, of wrought yellow deal. The styles, rails and head were 1⅞ in. thick, and the panels were ⅝-in. thick. The moulding around panels was 1¾ in. wide, and was fixed in panels on both sides of door.

The frame was of yellow deal 4½ in., by 3½ in. with a rebate for door ⅝ in. deep.

The sill was of oak 4½ in. by 3 in.

The door was hung with one pair of 4 in. wrought iron butts, and fastened with a mortice lock and brass furniture.



Figs. E, F.

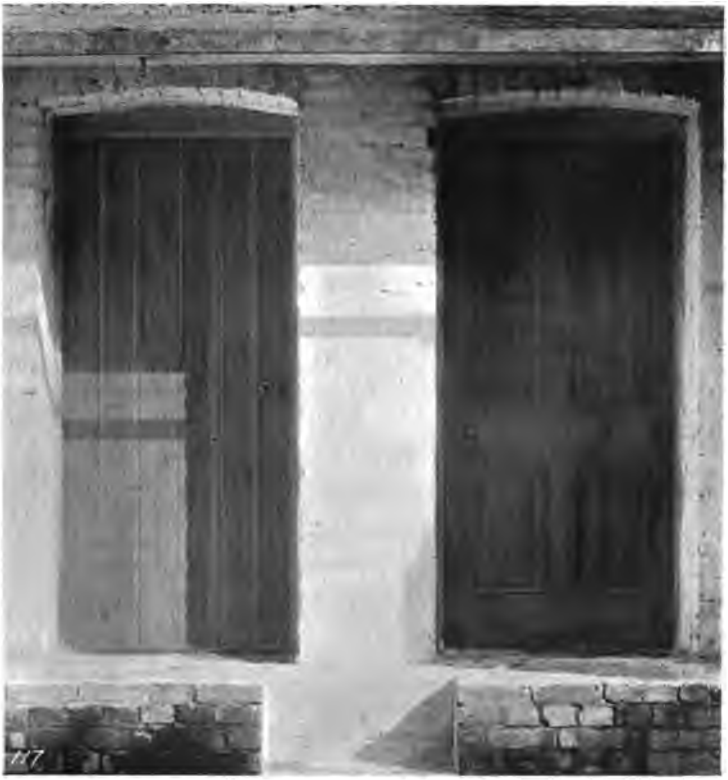
PREPARATIONS FOR TEST.

On the afternoon of July 11th, photographs were taken of the two doors from the outside. (See Fig. G).

THE TEST.

(See Figs. 1 *to* 12, *and* H *to* L*).*

On July 11th, the test was undertaken. The following is the log of the test :—



THE DOORS. *Fig.* G. VIEW BEFORE TEST (FROM OUTSIDE).

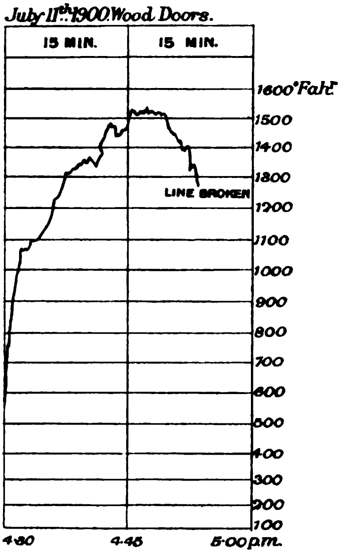
At 3 p.m. the meteorological observations taken at the Botanic Gardens, Regent's Park, read as follows :—"State of weather, Clear and fine; Wind, N.W.; Barometer, 30·07; Attached Thermometer, 72·4° Fahr.; Dry bulb, 83° Fahr.; Wet bulb, 65·5° Fahr."

The following temperature observations were taken during the test from points Nos. 1, 2, 3 and 4.

OBSERVATIONS TAKEN AT POINTS, 1, 2, 3, 4.
From 4.33 *p.m. to* 4.54 *p.m.*

	INSIDE.		OUTSIDE.	
TIME.	No. 1. Fahr.	No. 4. Fahr.	No. 2. Fahr.	No. 3. Fahr.
4.30 p.m.	—	—	—	—
4.33 ”	710°	850°	—	—
4.36 ”	1,110°	1,150°	100°	—
4.39 ”	1,375°	1,400°	460°	—
4.42 ”	1,440°	1,440°	740°	—
4.45 ”	1,530°	1,530°	1,010°	105°
4.48 ”	1,560°	1,550°	1,350°	1,140°
4.51 ”	1,575°	1,575°	1,500°	1,210°
4.54 ”	1,460°	1,500°	1,200°	1,100°

Automatic Record at Point No. 5.



DEAL LEDGED DOOR.	DEAL FOUR-PANEL DOOR.
At 4.30 p.m. the gas was turned on.	At 4.30 p.m. the gas was turned on.
Observations on Inside.	*Observations on Inside.*
At 4.34 p.m. door blazing freely all over the surface, the face charred.	At 4.34 p.m. door blazing freely all over the surface, the face charred.
	At 4.43 p.m. pieces of charred moulding falling from the panels.
At 4.46 p.m. pieces of charred wood falling.	
Observations on Outside.	*Observations on Outside.*
At 4.31 p.m. smoke issuing between rebate of frame and top of door and down each side for about three feet.	At 4.31 p.m. smoke appeared between rebate of frame and top rail of door and down each side for about three feet.
At 4.34 p.m. flame appeared between rebate of frame and top of door at west corner.	
At 4.38 p.m. flame extended all along top.	At 4.38 p.m. resin flowing down top rail.
At 4.44 p.m. flame extending down each side of door and through joints, also glow along bottom.	
	At 4.45 p.m. smoke came through between moulding and west style at top, with flame along top of door.

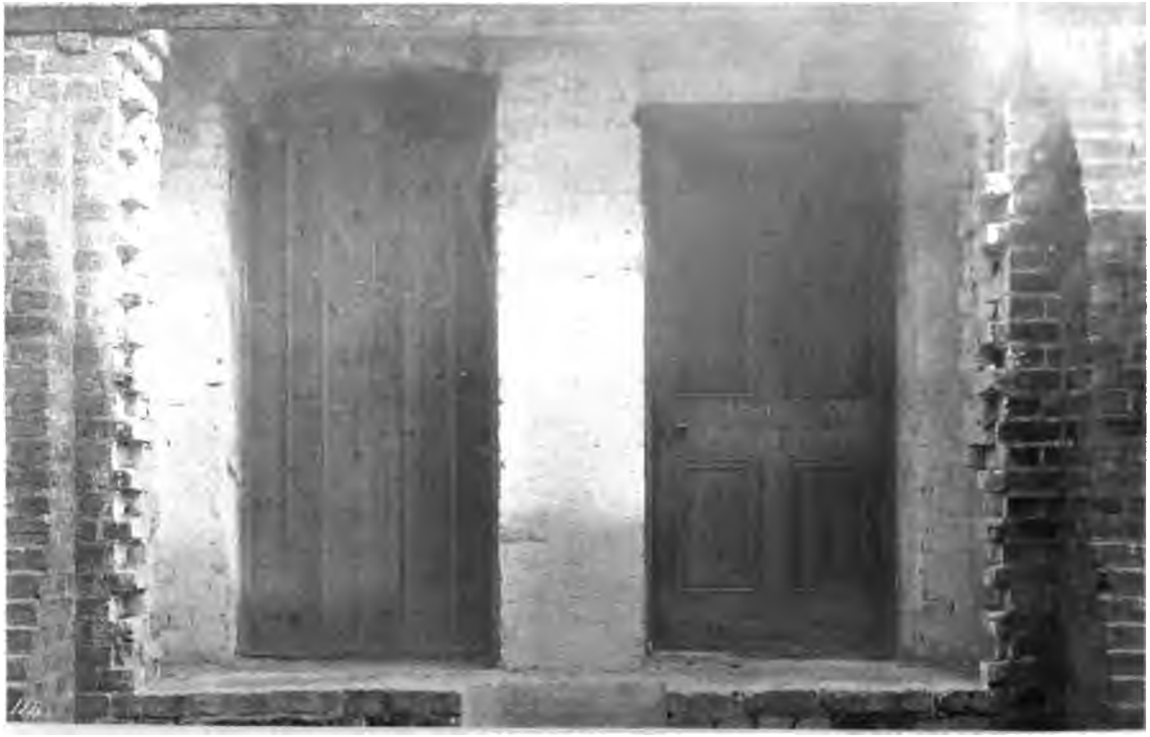


Fig. 11. View Showing Condition of Doors after 5 Minutes.

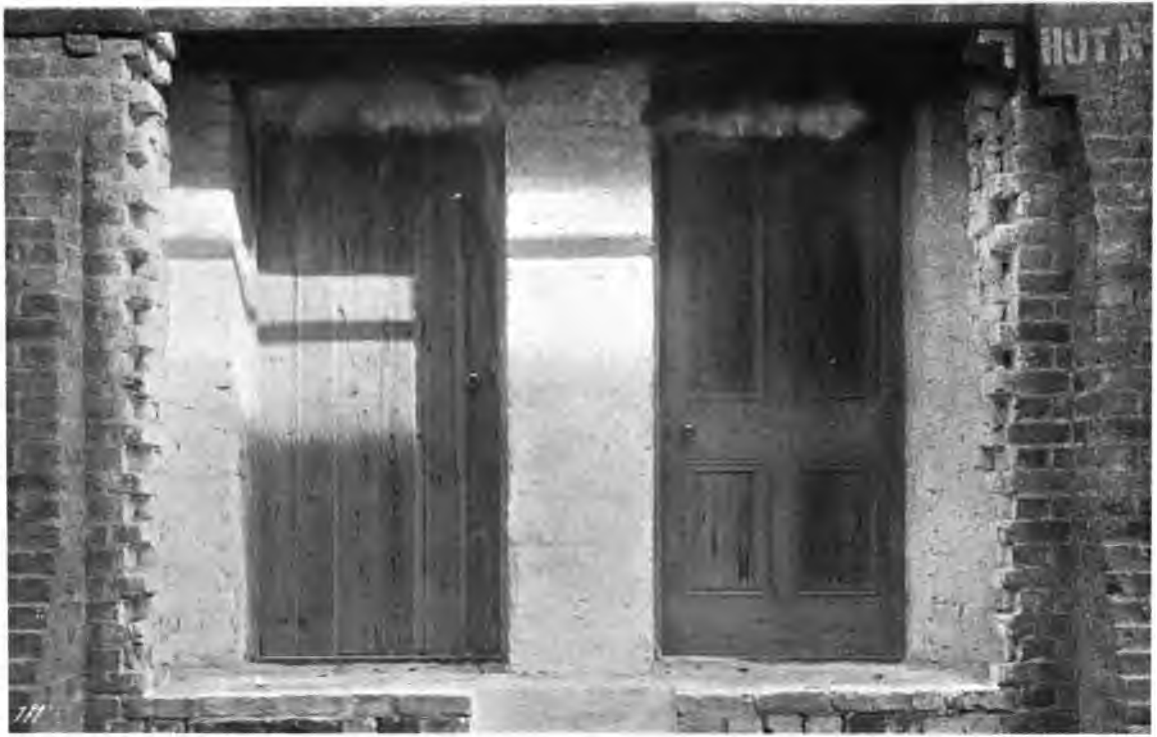


Fig. 1. VIEW SHOWING CONDITION OF DOORS AFTER 15 MINUTES.

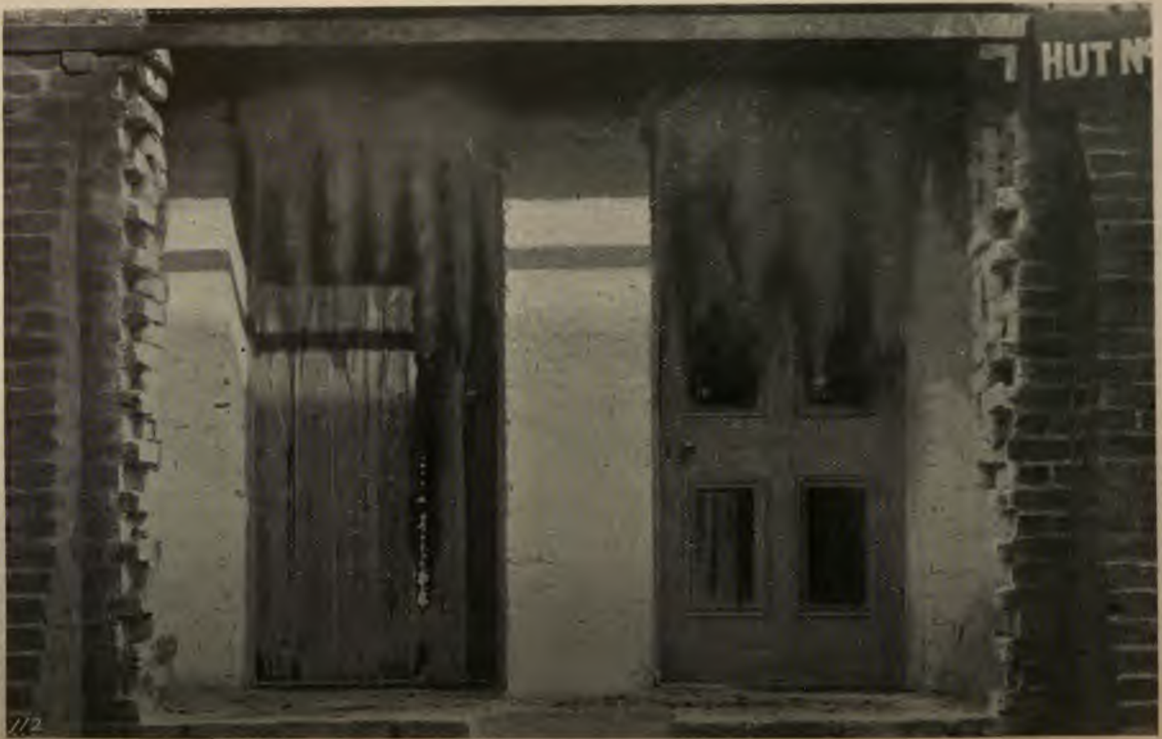


Fig. K. View Showing Condition of Doors after 19 Minutes.

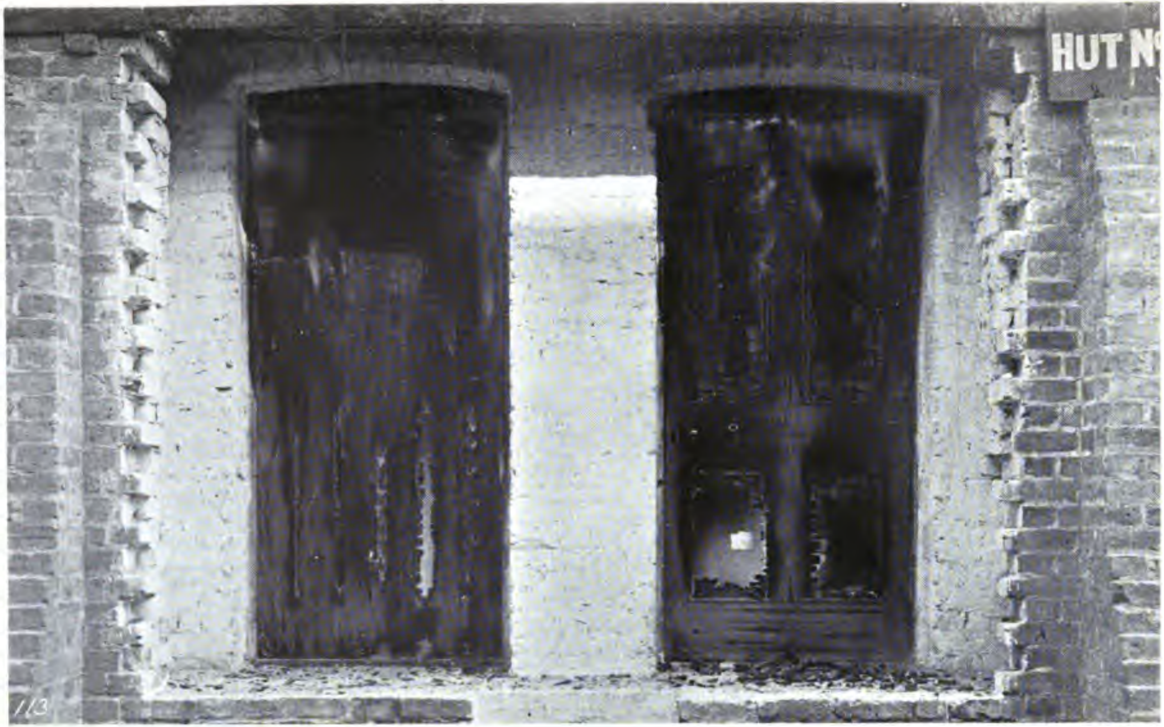


Fig. L. View Showing Condition of Doors after 25 Minutes.

DEAL LEDGED DOOR—*continued.*

At 4.47 p.m. glow seen through several joints.

At 4.51 p.m. the upper half of door fully alight, glow appearing through all joints in lower portion.

At 4.55 p.m. all joints open and blazing.

At 4.55 p.m. the gas was shut off.

At 4.57 p.m. water was applied and the test was closed.

DEAL FOUR-PANEL DOOR—*continued.*

At 4.46 p.m. flame appeared through top panels right and left.

At 4.48 p.m. holes burnt through top panels, lower panels charring.

At 4.50 p.m. the bottom left panel had flame through.

At 4.51 p.m. both lower panels in flame.

At 4.55 p.m. the gas was shut off.

At 4.57 p.m. water was applied and the test was closed.

OBSERVATIONS AFTER TEST.

DEAL LEDGED DOOR.

On July 12th the door and frame were still in position, but charred on the inside face; also all vertical joints burnt through and the outer face of upper part much charred.

DEAL FOUR-PANEL DOOR.

On July 12th the door and frame were still in position, but charred on the inside face, the panels being burnt out.

GENERAL ARRANGEMENTS.

The test was carried out according to the procedure laid down by the Executive for investigations of this description, and conducted by a Sub-Committee of the Executive, comprising :—

Mr. Ellis Marsland, District Surveyor, Camberwell, (Directing Member).
Mr. Max Clarke, A.R.I.B.A.
Mr. F. R. Farrow, F.R.I.B.A.

Mr. Thomas Kissack, Resident Engineer at the Testing Station, assisted the Sub-Committee.

Mr. H. B. White, M.I.E.E., superintended in the instrument room.

The Council was represented by :—

Mr. Arthur Cates, F.R.I.B.A., F.S.I., late Surveyor Crown Estates.

The Executive was represented by :—

Mr. Edwin O. Sachs (Chairman).
Mr. Chas. E. Goad, M.Am.Soc.C.E., M.Can.Soc.C.E.
Mr. T. E. Gatehouse, F.R.S.Ed., A.M.Inst.C.E., M.I.M.E., M.Inst.E.E.
Mr. F. Hammond, F.R.I.B.A., District Surveyor, East Hampstead.

The Members' Testing Sub-Committee was represented by :—

Mr. George E. Monckton, M.A.

The general body of members was represented by :—

Mr. F. Sizer Capon (Architect's Department, L.C.C.)

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The following visitors attended by special invitation of the Executive :—

Mr. P. Blaschke, Mr. J. Burgess, Mr. H. A. Cheers, Mr. W. Fiddaman, Mr. E. J. A. Fulkes, Mr. Albert Gray, Lieut. P. S. Greig, R.E., Mr. G. F. Harrington, Mr. W. Hayne, Mr. J. Hurles, Mr. R. Morphew, Mr. C. Petri, Mr. E. Robins, Mr. P. Simpson, Mr. A. W. Smith and Sir George Thomas.

Signed,

For the Sub-Committee conducting the Test :

ELLIS MARSLAND.

For the Commercial Section :

FREDERIC R. FARROW.

For the Executive :

EDWIN O. SACHS.

Published by the Committee as
directed by the Executive.

H. S. TAYLOR
(Assistant Secretary).

Date—November 15*th*, 1900.

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